

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES
FOURTH SERIES

VOL. XVI, No. 10, pp. 261-359, 1 text-figure

APRIL 27, 1927

X

THE BIRDS AND MAMMALS OF MODOC COUNTY,
CALIFORNIA

BY

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INTRODUCTION

In ornithological and mammalogical literature touching upon the distribution of the birds and mammals of California, the small number of references to the northeastern part of the state seemed to warrant the assumption that a promising field for investigation lay in that quarter. With this idea in view, a reconnoitering trip was made to Modoc County in the spring of 1923, with Robert J. Wood as field assistant, in an endeavor to discover the most favorable localities in which to carry on observations and to collect desirable specimens supporting the distributional records made. The experience gained on this trip showed the possibilities existing in the region, and led to the planning of the more extended research that was carried on as outlined in the list of localities visited.

ITINERARY AND LOCALITIES VISITED

As so large a portion of this county is included in National Forest domain, it was decided that a good way to acquire needed information would be to keep in touch with the Forest Service stations, for the reason that the forest rangers are,

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interest to be found in that part of Modoc County, and, consequently, Eagleville, 15 miles farther south, with its nearby laguna, was not visited, and possibilities afterwards discovered to exist there were not then realized.

In the spring of 1924, Modoc County was visited again, the party this time consisting of Mr. Frank Tose, group artist and chief taxidermist of the Department of Exhibits, of the California Academy of Sciences, Jack Malloch, field assistant, and myself. Information acquired after the completion of the work in the previous year made it seem advisable to proceed first to Eagleville in order to try out that vicinity, and the result was that this place has since then been the headquarters for our Modoc County field work.

On this first visit to Eagleville, the party remained in the vicinity from May 22 until June 15. It had been the intention to reach Modoc County considerably earlier, but the party was unexpectedly detained on the way, not reaching its destination until rather too late to intercept much of the spring migration, yet a good deal was accomplished in spite of this setback. Camps were also made at the Buck Creek Forest Service Station, June 15 to 17, and at the Happy Camp Station, June 17 to 20, but at neither of these places did it appear to be profitable to make much of a stay at this season.

In order to learn more about the bird migrations in this part of California, Modoc County was visited in each of the three following autumns, each time with Eagleville as headquarters: In 1924, from September 3 to October 9, with Jack Malloch as field assistant; in 1925, from September 8 to October 16, with Jack Denver as assistant; in 1926, from August 28 to October 7, with Raymond M. Gilmore and Paul F. Covel as assistants, but on this occasion the first five days were passed at the Pit River Forest Service Station in order to pick up on the way some needed specimens.

Deep Creek Forest Service Station

Just inside the mouth of the Deep Creek cañon, at an elevation of 5000 feet and two miles southwest of Cedarville, Surprise Valley, lies the Deep Creek Forest Service Station. This cañon is long and narrow, running nearly east and west

and heading high up on the Warner Range, at that point over 7000 feet in altitude, and opening into Surprise Valley.

It is a relatively chilly cañon, as much of it is shaded by the mountains on the southern side for a large part of the year, especially in the fall, and did not prove to be favorable for our work, in spite of the fact that it was of quite diversified character, extending from sagebrush covered Upper Sonoran to high Transition, with brushy, rocky, and grass-grown areas scattered along its sides. Nor did the part of Surprise Valley in the vicinity of Cedarville appear to be very promising at the time of our visit. Rodent traps were set out in the neighborhood, but failed to bring in results; and birds were scarce, so that only a short stay was made here in the spring of 1923. On later visits to Surprise Valley, the Deep Creek cañon was several times gone over in the search for material worth recording, but without much success.

Buck Creek Forest Service Station

This station is placed at an altitude of 5300 feet on the southerly slope of the spur of the Warner Range forming the northern boundary of the Fandango Valley, and is about four miles east of the Willow Ranch Station of the Nevada, California, and Oregon Railroad running along the eastern shore of Goose Lake (altitude 4800 feet). On Willow Ranch is an extensive meadow, more or less swampy, with large willow thickets here and there, and the banks of Fandango Creek, flowing through the meadow, are lined in some places with a thick growth of cottonwoods.

The ranger station itself is on a slope thickly strewn with crumbled lava, overgrown with more or less forest where enough soil for tree growth has collected, and with sagebrush and other bushes in less favored areas. There is also a good deal of surface where the lava is too thick for the growth of vegetation, and which looks as if it had cooled only within the last few years. The forest of yellow pine and incense cedar extends in places out on to the floor of Fandango Valley, as does the lava and sagebrush, but there are small meadows near the station and upland meadows of greater extent farther up the valley. This is a well watered district, and there were more birds noted around the station itself than

in any place visited in 1923, but the avian population rapidly diminished in inverse ratio to the increase of the radius from this center, and birds were remarkably scarce in the surrounding country, in spite of its varied association and attractive appearance. Rodents also were scarce here, especially meadow mice and gophers, of which none was secured at this station. This, however, was evidently only a temporary condition as regards the rodents, particularly the meadow mouse.

Pit River Forest Service Station

This station is situated nearly a mile north of the Pit River and some seven miles about west-southwest from Canby post-office in a small side valley opening into a meadow in the river bottom. Its altitude is about 4400 feet and the surrounding area is of the same sort of forest, lava, and sagebrush association as that of Buck Creek, and, in fact, of a great part of the plateau region of the county, but the meadows here are small and not very well watered.

During the reconnoissance of this place in 1923 not much of special interest seemed to develop, so but a short stay was made—from May 31 to June 4. There were one or two gophers here at the time, however, and the diagnosis of one specimen secured led to a second visit being made, for the purpose of further investigation, August 28 to September 1, 1926. Also, Gilmore and Covell were sent to the vicinity for a week at the end of September of that year with instructions to work the river banks, minks being especially desired.

Jess Valley

This valley lies six or seven miles southwest of the summit of Eagle Peak (9934 feet), the highest point of the Warner Range in California. Through the valley flow the streams that at its western end combine to form the South Fork of Pit River. The floor of the valley, at an elevation of over 5000 feet, consists of a slightly rolling meadow of some four square miles in extent, backed on three sides by mountains and shut in at its western end by a range of rocky hills cleft only by a narrow gorge through which the river flows, hemmed in on either side by massive dykes of lava. There

is a good forest of yellow pine, cedar, and fir partly surrounding the valley, and also a large amount of rough, lava-strewn territory, on which grows more or less sagebrush. In the valley bottom there are many willow thickets and some cottonwoods along the streams. In the lowest part, water stands over considerable areas of land, but whether this is a natural condition, or whether the standing water was only drainage from the irrigated meadows, I did not discover. Probably it was the latter. Waterfowl in limited numbers were apparently nesting in this submerged area, but for want of a boat it was not carefully examined. The birds noted here were practically the same as those to be found in similar territory elsewhere in the county.

Surprise Valley and Eagleville

As most of our field work was done in this valley, a rather more detailed description of this part of the county seems warranted. Surprise Valley lies on the eastern side of the Warner Mountain Range and extends from Mount Bidwell, which is three or four miles south of the Oregon state line, almost due south some 50 miles to a little beyond the northern boundary of Lassen County (California), with a width varying from four or five miles to seven or eight miles, reckoning between the bases of the hills on either side. Extending nearly the whole length of the bottom of the valley is a chain of narrow lakes, called Upper Lake, Middle Lake, and Lower Lake. They are merely sinks into which flows the water of the streams from the mountains flanking the valley, forming, in the rainy season, very shallow bodies of water. In dry seasons, when practically all of the stream flow is used for irrigating the meadow lands, the beds of the lakes are mostly expanses of alkali sand, so dry that it rises in clouds with every breeze, and over which whirlwinds may often be seen pirouetting in fantastic waltzes.

At only one place in the lakes do tules grow in sufficient quantities to become much of a factor affecting the bird life of the valley. This is at the south end of Middle Lake, around and in a clay-bottomed laguna, called Cameron Lake, which is shallow, but deeper than the rest of the main lake, and which contains water the year around in normal seasons.

its size varying with the time of year and the amount of rainfall from a small pond to an area of several hundred acres, at times becoming part of Middle Lake itself. In normal years it is a nesting ground for several species of water- and marsh-loving birds, and in the fall a resting and feeding ground for comparatively large numbers of wild ducks and other waterfowl. In places along some of the streams flowing into the lakes and around some small springs here and there in the meadows is also a limited growth of tules that gives nesting cover to some species of birds, but in no place is it of sufficient extent to have much effect upon the bird life.

A meadow lies along the western side of the lakes for nearly their whole length and extends around their ends, varying in breadth from a few hundred yards to over two miles, according to the contour of the foothills of the Warner Range. This meadow is irrigated from the small mountain streams crossing it, which are dammed as occasion requires and the water led through small ditches to spread over the gently sloping fields. This system, used very extensively in the meadows of Modoc County, makes possible the raising of much meadow hay and alfalfa, for feeding to livestock through the long winters, and, to some extent affects the local fauna.

Between this meadow land and the Warner Range there is a rolling plain, largely of land arable when cleared, that is covered with sagebrush and other Upper Sonoran plant growths, and from it the foothills rise abruptly. In fact, in some places along this western side of the valley the mountains rise so steeply that there are practically no foothills, and here the change from Upper Sonoran to Transition is almost startling.

The eastern side of Surprise Valley is a rolling plain, typically desert in character, partly rocky, in places covered with sand dunes; much of it is strewn with volcanic ejecta, and other areas are hummocky clay, swept bare by heavy winds, with sagebrush and thorny desert bushes scattered over all. This plain slopes gradually up until it merges into the foothills of the western Nevada mountains. It has a few small streams struggling across it, and springs, some hot and some

cold, occur along the lower levels. Some of the springs form good sized ponds or lagunas, where ducks and other waterfowl congregate, such as Boyd's Springs, northeast of Lake City, where the main pond must be about half a mile in length.

At the north end of Surprise Valley stands historic Fort Bidwell, noted as the headquarters of the United States troops during the Modoc Indian outbreak of 1873. The small settlement, where the Modoc Indian school is now located, was placed at the southern base of Mount Bidwell, which, from its height of 8551 feet, looks down upon the whole length of the valley. Mr. H. W. Henshaw passed some time here during part of his work on the Wheeler Geographical Survey in the field seasons of 1877 and 1878, yet there are but few records of specimens taken actually in the vicinity of Fort Bidwell, or even in any part of Surprise Valley. Most of the records published in the report of that survey (Henshaw, 1879) are general rather than specific in character, and a record often includes adjacent parts of the three states, California, Oregon, and Nevada.

Besides the three settlements already mentioned, there is another, Lake City, a mile or so west of the lower end of Upper Lake. This is a small place, noted as being productive of the best quality of fruit raised in the valley.

Eagleville, as before remarked, was selected as headquarters for the Academy field parties for most of the work done in the county, as it offered the best combination of associations that could be found, with the desert on the eastern side of the valley; the laguna (Cameron Lake) two miles east of the town, between the desert and the meadow land that extends up to the settlement itself; the large Upper Sonoran sagebrush area, here and there cleared for grain fields, that reaches to the base of the Warners; and the narrow belt of Transition, partly forested at the higher altitudes, merging into the limited area of Boreal Zone on the highest summits of the range.

In addition to the highway that runs north and south through the valley, there are roads, passable except in winter, that make a large part of this territory accessible from Eagleville; and within easy reach of that place apparently occur

nearly all of the species of land birds, and, in favorable seasons, also a large proportion of the water, shore, and marsh birds, to be found in the county.

METEOROLOGIC CONDITIONS

The number of adults of resident species of birds or mammals that survive the hardships of the winter season depends to a considerable extent upon meteorological conditions, and it is evident that the number of young raised depends largely upon the number of adults surviving at the time the breeding season begins. Moreover, since the migratory activities of certain species of birds are largely affected by abnormal weather conditions, it seems in place to say something of the meteorological conditions, particularly rainfall, during the years in which the Academy parties visited Modoc County.

The rainfall of California has been on a general decline for some 20 years past, with many seasons showing an amount of rain below normal, and but few showing any great rise above it. Figures are at hand from which can easily be computed the departures from normal of the central region of California, at the latitude of San Francisco, and, while these figures are not strictly applicable to the Modoc region, there is good evidence to show that similar general conditions prevailed there during the periods below mentioned.

For central California the total precipitation was practically normal for the 20-year period beginning with the rainy season of 1886-87, but the period from 1906-07 to 1925-26, inclusive, shows a relatively large deficiency, most particularly in its latter half. The totals of the departures for the whole of the latter of these two 20-year periods are, expressed in percentage form with normal at 100 per cent: above normal precipitation, 117 per cent; below normal, 355 per cent; balance 238 per cent less than normal, or, in other words, a deficiency in total rainfall for the 20 years of 51.6 inches. The latter half of this period, however, is principally responsible for this deficiency, the respective departures being 20 per cent and 221 per cent, leaving a balance on the wrong side of 201 per cent, or a deficiency of 42.4 inches for the 10 years ending with the season of 1925-26. The normal 21.7 inches

per annum, in these instances is the average of three stations in central California, which, of course, would not be the actual normal for Modoc County, but the departure percentages for the latter region would probably closely parallel those given here. In consequence of this deficiency of precipitation, the water table has been greatly lowered, the flow of springs and streams lessened and the lakes have had their water content sadly depleted. These conditions have had a very appreciable effect upon the fauna of the Modoc region, but it would take some years to discover to how great an extent.

Many ducks, cranes, and marsh birds breed in Modoc County when conditions are favorable, but some of the recent years have had so little rainfall that shallow lakes, and most of the lakes in this region are shallow, have dried up completely. Others have had so little water in them that the nesting activities of birds accustomed to breed there have been greatly impeded or rendered impossible. A good example of this condition was found in 1924, when Cameron Lake, usually containing water the year around and having meadows and swamps in close proximity, forming a good nesting ground, was reduced to a small area of foul mud with dead or dying tules on all sides, and the adjacent swamps were dry.

In that year of drought, Goose Lake was so low that the meadows at the south end, ordinarily teeming with ducks and marsh birds, had no bird life present at the time of our spring visit except a few ducks, terns, and phalaropes that were pitifully hovering around a little pond, a few yards in diameter, unable to realize that there was no other place for them to nest.

Of the years in which Modoc County was visited by Academy field parties, the rainy season of 1922-3 was about normal, except possibly for the very cold spring, several snowstorms occurring in May and June. Even then Goose Lake was evidently much below the normal water level, as shown by the lines of gravel wash on its shores, and the lakes in Surprise Valley were almost dry as early as May. The rainy season of 1923-4 was one of great drought, the lakes in Surprise Valley being quite dry early in the spring, and Goose Lake showing large areas of sandspits and islands that were not in evidence the year before. The rainfall of the

1924-5 season was again nearly normal, and Cameron Lake, the only one visited by the Academy party of the autumn of 1925, was quite a body of water. Upon its surface were hundreds of ducks, many of which had been raised there.

The next season was dry, though some late spring rains had helped out the farmers' crops, and the lakes and springs were drier than in the previous two years. The larger lakes in the northwestern part of the county were reported to be very low, and but few ducks and marsh birds could find places to breed. Strangely enough, the spring of 1926 proved to be a very favorable one for the nesting of some of the gallinaceous birds. The two species of quail were especially abundant in the fall of that year, and Sage Grouse were reported as being numerous during the open season for that species. Unfortunately these birds are liable to great losses in the winter time. If they are covered by a snowfall that changes to rain and is followed by a continued frost, the birds become frozen in and starve to death. It also happens that some spring seasons in this region are very wet, with occasional snowstorms occurring even well into June, and many broods fail to survive the ordeal.

That the weather in the fall affects the migration of birds was well exemplified in the case of jays and Gambel's Sparrows in the years 1924, 1925, and 1926, as shown in the text of the accompanying annotated list, the great numbers appearing in migration during the dry seasons proving that a well-watered route is the most popular one at such times.

SOURCE OF MATERIALS

The lists of birds and mammals accompanying this paper are made up from the following sources: Available published records; through the courtesy of its director, Dr. Joseph Grinnell, field notes and specimens in the Museum of Vertebrate Zoology, University of California, Berkeley, California; notes and material obtained by field parties from the Department of Ornithology and Mammalogy, California Academy of Sciences; and, to a slight extent, reports of reliable resident hunters, the accuracy of whose statements in regard to certain well known species there seemed to be no reason to doubt.

During the field work of the Academy parties endeavor was made to secure as many of the species of birds and mammals of the region as possible, rather than to collect large quantities of material already well represented in collections. The number of birds collected within the actual boundaries of Modoc County was 735, and of mammals, 311, making a total of 1046 specimens taken by Academy parties. Banding of sparrows, practically all being Gambel's Sparrows (*Zonotrichia leucophrys gambelii*), was carried on in the fall of 1925 and 1926, when the numbers of birds banded were respectively 387 and 943, or a total of 1330.

Attention is called to the fact that the northwestern part of Modoc County was not visited by any Academy party, so that all records given for that region were made by others. Something always seemed to prevent our reaching that locality. Bad weather with consequent bad roads, the drying up of the lakes and water holes, or unfinished work in other places were the causes of this neglect. However, one of our parties had done some work in eastern Siskiyou County, very close to the border line of Modoc County, without discovering anything not found in or recorded from the latter county.

In spite of the earnest and constant search on the part of its compiler, Dr. Joseph Grinnell, there may yet be some published records applying to this region to which there is no clue in the *Bibliography of California Ornithology* (Pacific Coast Avifauna, Nos. 5 and 16). It seemed as if there should be available in Washington, D. C., some records to include in these lists of birds and mammals of Modoc County, but Miss M. E. McLellan, assistant curator of the Department of Ornithology and Mammalogy, very kindly made a search of the records and collections of the United States National Museum and the Biological Survey without discovering anything that does not appear in the accompanying lists.

The occurrence of certain birds and mammals (the generic identification, at least, being unquestioned) in Modoc County has been reported by residents and other observers, but the reports have not been supported by specimens, nor are there any specific published records. In such cases, the names have been placed in a hypothetical list for future substantiation or rejection, as the case may be.

Had the autumn visits of the Academy parties been extended later into the season, possibly a few more avian records might have been obtained, but, toward the middle of October so few birds linger in this part of the state, at an elevation from 4500 feet and upward above the sea, that it soon becomes impossible to find much ornithological work to do while waiting for the appearance of something worth recording. Some work could be done in securing specimens of mammals to support the statements of occurrence by residents, for mammals might be taken more readily after the snow falls than earlier in the season, but in carrying on such work a great deal of time and energy would have to be expended to accomplish what might prove to be relatively small results.

Moreover, there is no record of any systematic field work having been carried on in Modoc County in the winter time, so the accompanying lists, particularly the list of birds, are not presented as complete, but as a good basis upon which other investigators may wish to build as time goes by, as well as something by which future students may compare the present status of the bird and mammal life of this region with that of their generation.

The ornithological nomenclature employed in this paper is practically that of the American Ornithologists' Union *Check-List*, of 1910, and the subsequent *Supplements*. In certain cases, however, where suggested changes seem sufficiently warranted by light recently thrown upon the subject, some departures have been made.

With increased practice on the part of experts in this line, the matter of subspecific differentiation is becoming so complicated that the average ornithologist or mammalogist cannot keep pace with production and seldom has an opportunity to familiarize himself with the subjects in question. In many of the more finely drawn cases that come before him, he must choose one of two courses—he must either blindly accept or reject the dictum of the describer, or he must leave in abeyance such cases as he cannot prove to be, or convince himself of their being, worthy of recognition. It is the latter course that has been pursued in this paper.

ACKNOWLEDGMENTS

For assistance of various sorts and for many courtesies shown to me in the field and in the study, I am indebted to a number of individuals, so many that they cannot all be mentioned here.

This paper would have been only a report upon the observations made and the material secured in northeastern California by field parties from the Academy had it not been for the courtesy shown by Dr. Joseph Grinnell, Director of the Museum of Vertebrate Zoology, University of California. In the early part of the field work, I took some specimens to the Museum of Vertebrate Zoology for comparison. Dr. Grinnell was kind enough to place at my disposal all the museum's specimens and notes pertaining to the Modoc region, and to suggest that I include in my report all the information that could be gathered from this source. There is in that museum much material from Modoc County, the greater part having been secured by a field party that collected specimens and kept journals of observations during an expedition to this territory in 1910, when work was carried on from late May until early August. At this time a cross section survey was made of the bird and mammal life of the country lying between Goose Lake and Cedarville, Surprise Valley, when camps were established at intervals from the lower levels to the summit of the Warner Range. This party was composed of three zealous young fellows just entering the zoological field. Since that time two of them, H. C. Bryant and W. P. Taylor, have followed up zoological work in special directions and become well known in their particular lines of endeavor. At the time of the Modoc expedition, the members of the party were new to the work, and in cases where there might arise question as to their identification of species their manuscript records have not been used.

In addition to the advice and practical assistance given by Doctor Grinnell whenever it was sought, I take pleasure in acknowledging my indebtedness for aid and information to the following individuals: to Messrs. H. S. Swarth and Joseph Dixon, and other members of the Museum of Vertebrate Zoology staff, who have ever been ready to lend a helping hand in diagnosis of material and in other ways; to Miss

M. E. McLellan, assistant curator, Department of Ornithology and Mammalogy of the California Academy of Sciences, for the part taken by her in the preparation of this paper; to Messrs. James A. and Frederick Street, managers of the general store in Eagleville, who have been much interested in our work and who have assisted us in many material ways, giving much valuable advice concerning the locality, and, as experienced hunters of wild game in Modoc County, imparting much information touching upon the bird and mammal life that has come under their observation; to Mr. F. A. Nolan, owner of the old hotel building in Eagleville, who kindly allowed our parties to occupy the building, free of charge, for three successive visits; to residents of Eagleville and vicinity, who have been interested in our work, allowing us to collect on their premises, often bringing us material of much value, and aiding us in many practical ways; to Forest Rangers Ben. Johnson, at that time in charge of the Deep Creek Station, Lawrence Smith, of the Buck Creek Station, and Ivan Cuff, of the Pit River Station, all of whom received us most hospitably and helped us in every way possible. Acknowledgments are due to Mr. Frank Tose, group artist and chief taxidermist of the Department of Exhibits of the Academy, who accompanied me to Modoc County in the spring of 1924 and who was indefatigable in his search for new and interesting records, and also to the field assistants who cheerfully responded to every call, irrespective of hour or day, the names of whom are mentioned in the list of places visited.

CHECK-LIST OF THE BIRDS

- | | |
|---|--|
| 1. <i>Æchmophorus occidentalis</i>
(Lawrence) | 11. <i>Pelecanus erythrorhynchos</i> Gmelin |
| 2. [See footnote, page 278] | 12. <i>Mergus americanus</i> Cassin |
| 3. <i>Colymbus nigricollis californicus</i>
(Heermann) | 13. <i>Lophodytes cucullatus</i> (Linnæus) |
| 4. <i>Larus californicus</i> Lawrence | 14. <i>Anas platyrhynchos</i> Linnæus |
| 5. <i>Larus delawarensis</i> Ord | 15. <i>Mareca americana</i> (Gmelin) |
| 6. <i>Larus philadelphia</i> (Ord) | 16. <i>Nettion carolinense</i> (Gmelin) |
| 7. <i>Sterna caspia imperator</i> (Coues) | 17. <i>Querquedula cyanoptera</i> (Vieillot) |
| 8. <i>Sterna forsteri</i> Nuttall | 18. <i>Spatula clypeata</i> (Linnæus) |
| 9. <i>Chlidonias nigra surinamensis</i>
(Gmelin) | 19. <i>Dasila acuta tzitzihoo</i> (Vieillot) |
| 10. <i>Phalacrocorax auritus</i> subspecies | 20. <i>Marila americana</i> (Eyton) |
| | 21. <i>Marila valisineria</i> (Wilson) |
| | 22. <i>Marila marila</i> (Linnæus) |

23. *Marila affinis* (Eyton)
24. *Marila collaris* (Donovan)
25. *Charitonetta albeola* (Linnæus)
26. *Eristamta jamaicensis* (Gmelin)
27. *Chen hyperboreus hyperboreus* (Pallas)
28. *Anser albifrons albifrons* (Scopoli)
29. *Branta canadensis canadensis* (Linnæus)
30. *Branta canadensis minima* Ridgway
31. *Cygnus columbianus* (Ord)
32. *Plegadis guarana* (Linnæus)
33. *Botaurus lentiginosus* (Montagu)
34. *Ardca herodias hyperonca* Oberholser
35. *Chasmerodius egretta* (Gmelin)
36. *Nycticorax nycticorax navius* (Boddaert)
37. *Grus canadensis* (Linnæus)
38. *Grus mexicana* (Müller)
39. *Porzana carolina* (Linnæus)
40. *Fulica americana* Gmelin
41. *Lobipes lobatus* (Linnæus)
42. *Steganopus tricolor* Vieillot
43. *Recurvirostra americana* Gmelin
44. *Himantopus mexicanus* (Müller)
45. *Gallinago delicata* (Ord)
46. *Pisobia minutilla* (Vieillot)
47. *Limosa fedoa* (Linnæus)
48. *Totanus melanoleucus* (Gmelin)
49. *Catoptrophorus semipalmatus inornatus* (Brewster)
50. *Actitis macularia* (Linnæus)
51. *Numenius americanus* Bechstein
52. *Oxyechus vociferus vociferus* (Linnæus)
53. *Charadrius nivosus* (Cassin)
54. *Oreortyx picta plumifera* (Gould)
55. *Lophortyx californica vallicola* (Ridgway)
56. *Dendragapus obscurus sierra* Chapman
57. *Pediæcetes phasianellus columbianus* (Ord)
58. *Centrocercus urophasianus* (Bonaparte)
59. *Zenaidura macroura marginella* (Woodhouse)
60. *Cathartes aura septentrionalis* Wied
61. *Circus hudsonius* (Linnæus)
62. *Accipiter velox* (Wilson)
63. *Accipiter cooperi* (Bonaparte)
64. *Astur atricapillus striatulus* Ridgway
65. *Buteo borealis calurus* Cassin
66. *Buteo swainsoni* Bonaparte
67. *Archibuteo ferrugineus* (Lichtenstein)
68. *Aquila chrysaëtos* (Linnæus)
69. *Haliaëctus leucocephalus leucocephalus* (Linnæus)
70. *Falco mexicanus* Schlegel
71. *Falco columbarius columbarius* Linnæus
72. *Cerchneis sparveria sparveria* (Linnæus)
73. *Pandion haliaëctus carolinensis* (Gmelin)
74. *Tyto alba pratincola* (Bonaparte)
75. *Asio wilsonianus* (Lesson)
76. *Bubo virginianus occidentalis* Stone
77. *Speotyto cunicularia hypogæa* (Bonaparte)
78. *Glaucidium gnoma* subspecies
79. *Ceryle alcyon caurina* Grinnell
80. *Dryobates villosus ortus* Oberholser
81. *Dryobates pubescens homorus* Cabanis & Heine
82. *Xenopicus alboravatus alboravatus* (Cassin)
83. *Picoides arcticus* (Swainson)
84. *Sphyrapicus varius nuchalis* Baird
85. *Sphyrapicus varius daggetti* Grinnell
86. *Sphyrapicus thyroideus* (Cassin)
87. *Asyndesmus lewisi* Riley
88. *Colaptes cafer collaris* Vigors
89. *Phalacroptilus nuttalli nuttalli* (Audubon)
90. *Chordeiles virginianus hesperis* Grinnell
91. *Archilochus alexandri* (Bourcier & Mulsant)
92. *Selasphorus rufus* (Gmelin)
93. *Stellula calliope* (Gould)
94. *Tyrannus tyrannus* (Linnæus)
95. *Tyrannus verticalis* Say
96. *Myiarchus cinerascens cinerascens* (Lawrence)
97. *Sayornis sayus* (Bonaparte)

98. *Nuttallornis borealis* (Swainson)
 99. *Myiochanes richardsonii richardsonii* (Swainson)
 100. *Empidonax difficilis difficilis* Baird
 101. *Empidonax traillii traillii* (Audubon)
 102. *Empidonax hammondii* (Xantus)
 103. *Empidonax wrighti* Baird
 104. *Empidonax griseus* Brewster
 105. *Otocoris alpestris merrilli* Dwight
 106. *Pica pica hudsonia* (Sabine)
 107. *Cyanocitta stelleri frontalis* (Ridgway)
 108. *Aphelocoma californica immanis* Grinnell
 109. *Perisoreus obscurus griseus* Ridgway
 110. *Corvus corax sinuatus* Wagler
 111. *Corvus brachyrhynchos hesperis* Ridgway
 112. *Nucifraga columbiana* (Wilson)
 113. *Cyanocephalus cyanocephalus* (Wied)
 114. *Dolichonyx oryzivorus* (Linnæus)
 115. *Molothrus ater artemisia* Grinnell
 116. *Xanthocephalus xanthocephalus* (Bonaparte)
 117. *Agelaius phæniceus nevadensis* Grinnell
 118. *Agelaius tricolor* (Audubon)
 119. *Sturnella neglecta* Audubon
 120. *Icterus bullockii* (Swainson)
 121. *Euphagus cyanocephalus cyanocephalus* (Wagler)
 122. *Hesperiphona vespertina montana* Ridgway
 123. *Carpodacus purpureus californicus* Baird
 124. *Carpodacus cassinii* Baird
 125. *Carpodacus mexicanus frontalis* (Say)
 126. *Astragalinus psaltria hesperophilus* Oberholser
 127. *Spinus pinus* (Wilson)
 128. *Passer domesticus* (Linnæus)
 129. *Poæcetes gramineus confinis* Baird
 130. *Poæcetes gramineus affinis* G. S. Miller
 131. *Passerculus sandwichensis alaudinus* Bonaparte
 132. *Passerculus sandwichensis nevadensis* Grinnell
 133. *Chondestes grammacus strigatus* Swainson
 134. *Zonotrichia leucophrys leucophrys* (J. R. Forster)
 135. *Zonotrichia leucophrys gambelii* (Nuttall)
 136. *Zonotrichia coronata* (Pallas)
 137. *Spizella passerina arizonæ* Coues
 138. *Spizella breweri* Cassin
 139. *Junco oreganus thurberi* Anthony
 140. *Amphispiza bilineata deserticola* Ridgway
 141. *Amphispiza nevadensis nevadensis* (Ridgway)
 142. *Melospiza melodia fallax* (Baird)
 143. *Melospiza melodia fisherella* Oberholser
 144. *Melospiza lincolni lincolni* (Audubon)
 145. *Passerella iliaca schistacea* Baird
 146. *Passerella iliaca sinuosa* Ridgway
 147. *Passerella iliaca altivagans* Riley
 148. *Passerella iliaca fulva* Swarth
 149. *Pipilo maculatus curtatus* Grinnell
 150. *Oberholseria chlorura* (Audubon)
 151. *Hedymeles melanocephalus capitalis* Baird
 152. *Passerina amæna* (Say)
 153. *Piranga ludoviciana* (Wilson)
 154. *Petrochelidon lunifrons lunifrons* (Say)
 155. *Hirundo erythrogaster* Boddaert
 156. *Iridoprocne bicolor* (Vieillot)
 157. *Tachycineta thalassina lepida* Mearns
 158. *Bombycilla cedrorum* Vieillot
 159. *Lanius ludovicianus excubitorides* Swainson
 160. *Vireosylva gilva swainsonii* (Baird)
 161. *Laniovireo solitarius cassinii* (Xantus)
 162. *Vermivora ruficapilla gutturalis* (Ridgway)
 163. *Vermivora celata lutescens* (Ridgway)
 164. *Dendroica astiva brewsteri* Grinnell
 165. *Dendroica auduboni auduboni* (J. K. Townsend)
 166. *Dendroica nigrescens* (J. K. Townsend)

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| 167. <i>Dendroica townsendi</i> (J. K. Townsend) | 182. <i>Sitta carolinensis aculeata</i> Cassin |
| 168. <i>Oporornis tolmiei</i> (J. K. Townsend) | 183. <i>Sitta canadensis</i> Linnæus |
| 169. <i>Geothlypis trichas occidentalis</i> Brewster | 184. <i>Sitta pygmaea pygmaea</i> Vigors |
| 170. <i>Icteria virens longicauda</i> Lawrence | 185. <i>Bæolophus inornatus griseus</i> (Ridgway) |
| 171. <i>Wilsonia pusilla pileolata</i> (Pallas) | 186. <i>Penthestes gambeli abbreviatus</i> Grinnell |
| 172. <i>Anthus rubescens</i> (Tunstall) | 187. <i>Psaltriparus minimus californicus</i> Ridgway |
| 173. <i>Cinclus mexicanus unicolor</i> Bonaparte | 188. <i>Psaltriparus plumbeus</i> (Baird) |
| 174. <i>Oreoscoptes montanus</i> (J. K. Townsend) | 189. <i>Regulus satrapa olivaceus</i> Baird |
| 175. <i>Salpinctes obsoletus obsoletus</i> (Say) | 190. <i>Regulus calendula cineraceus</i> Grinnell |
| 176. <i>Catherpes mexicanus conspersus</i> Ridgway | 191. <i>Myadestes townsendi</i> (Audubon) |
| 177. <i>Thryomanes bewickii drymæcus</i> Oberholser | 192. <i>Hylocichla ustulata swainsoni</i> (Tschudi) |
| 178. <i>Troglodytes ædon parkmani</i> Audubon | 193. <i>Hylocichla guttata guttata</i> (Pallas) |
| 179. <i>Nannvus hiemalis pacificus</i> (Baird) | 194. <i>Hylocichla guttata sequoiensis</i> (Belding) |
| 180. <i>Telmatodytes palustris plesius</i> (Oberholser) | 195. <i>Planesticus migratorius propinquus</i> (Ridgway) |
| 181. <i>Certhia familiaris zelotes</i> Osgood | 196. <i>Sialia mexicana occidentalis</i> J. K. Townsend |
| | 197. <i>Sialia currucoides</i> (Bechstein) |

GENERAL ACCOUNT OF THE BIRDS

1. *Æchmophorus occidentalis* (Lawrence). Western Grebe

A large number nesting on Clear Lake (Finley, 1911, p. 348); three seen at Goose Lake, June 12, 1912 (Dawson, 1916, p. 23); Clear Lake in early April, 1918 (Willett, 1919, p. 195); Tule Lake, a few seen on May 18, 1918 (Grinnell, MS). Evidently a common bird during spring and summer and probably resident to some extent.

3.¹ *Colymbus nigricollis californicus* (Heermann).

Eared Grebe

Speaking of this species, Henshaw says: "In Nevada, Oregon and California it is by far the most numerously represented of the family, and may be found at the right season on any and all of the lakes of this region where exist the proper nesting facilities" (Henshaw, 1897, p. 2312). Occurs on

¹ The species originally entered as number 2 is omitted from list, as evidence of its occurrence has finally been deemed insufficient to warrant its inclusion.

many of the lakes along the east side of the Sierras (Grinnell, 1915, p. 16). Yet, in spite of these statements of general distribution, this bird was unknown to the duck hunters of Surprise Valley.

On October 12, 1925, Mr. James A. Street, with some companions, hunting at Cameron Lake, shot half a dozen birds that were strange to them. One of the birds was brought to me for identification and proved to be a male Eared Grebe. On October 1, 1926, several of these grebes were found on one of the two ponds at Menlo Baths, four miles south of Eagleville, and five of them were secured for the Academy collection, all being immature birds.

4. *Larus californicus* Lawrence. California Gull

Occurs in summer on the larger lakes of northeastern California (Grinnell, 1915, p. 22). Breeding at Clear Lake (Finley, 1911, p. 348). Numbers, estimated at 1800, were noted at Clear Lake on April 10, 1918 (Willett, 1919, p. 196). One individual, in poor condition, was taken near Eagleville by the Academy party on May 28, 1924.

5. *Larus delawarensis* Ord. Ring-billed Gull

About 200 were noted at Clear Lake on April 10, 1918, among the *Larus californicus* that were assembled on the breeding grounds there (Willett, 1919, p. 196). This date was too early for nesting, but as this species breeds in numbers at Malheur Lake, Oregon, not far north of Clear Lake with, but not among, the *Larus californicus*, there is good reason to believe that it nests at Clear Lake, also.

6. *Larus philadelphia* (Ord). Bonaparte's Gull

Three immature birds were noted at Goose Lake on June 20, 1912 (Dawson, 1916, p. 24).

7. *Sterna caspia imperator* (Coues). Caspian Tern

"A company of some twenty birds" was noted on Goose Lake, near the mouth of Davis Creek, June 12-24, 1912



(Dawson, 1916, p. 24). No definite signs of nesting, however, were observed. Noted at Tule Lake, June 10, 1918, by Dr. B. W. Evermann (MS).

8. *Sterna forsteri* Nuttall. Forster's Tern

Summer visitant. On May 21, 1923, this species was noted at Willow Ranch where a few pairs were nesting on the small laguna near the railroad station. Also seen by the Academy field party in May, 1924, on the fast drying-up laguna two miles east of Eagleville where two or three pairs apparently were trying to find a suitable nesting ground. They did not succeed, however, as the drought had diminished the laguna to a mere puddle.

9. *Chlidonias nigra surinamensis* (Gmelin). Black Tern

Recorded as breeding at practically all of the lakes north-east of the Sierras (Grinnell, 1915, p. 25). Fresh eggs were secured by Dr. Barton Warren Evermann at Alturas Meadow, June 9, 1918. Birds of this species were seen by Academy parties in Jess Valley in June, 1923, and in Surprise Valley, in May, 1924.

10. *Phalacrocorax auritus*, subspecies

Nesting at south end of Tule Lake in 1895 (Finley, 1907, p. 36, photograph). Breeding on islands in Clear Lake, April 10, 1918, when about 100 pairs were noted, with many nests completed and some containing one or two eggs (Willett, 1919, 197). Mr. Willett remarks in his paper that he could not distinguish, even at short range, distinctive white nuptial crests on the heads of these cormorants and that, as no specimens have been secured for identification, he believes that there is a possibility of error in regard to the subspecies to which the cormorants of northeastern California have been ascribed.

11. *Pelecanus erythrorhynchos* Gmelin. White Pelican

Recorded as breeding at Tule Lake (Finley, 1907, p. 37). "From four hundred to five hundred pairs noted on islands at Clear Lake April 10 [1918]. At this date about one hundred and fifty nests were noted, many of which contained one or two eggs each" (Willett, 1919, p. 197). Reported by settlers to be very numerous in Surprise Valley at times when the lakes are full of water, in spite of the fact that there can be but few, if any fish there to serve them as food. I found the remains of one individual, killed in the previous winter, hanging on a fence near Eagleville, September 15, 1924.

12. *Mergus americanus* Cassin. Merganser

Eleven birds seen at Clear Lake in early April, 1918 (Willett, 1919, p. 198).

13. *Lophodytes cucullatus* (Linnæus). Hooded Merganser

One noted at Clear Lake on April 5, 1918 (Willett, 1919, p. 198).

14. *Anas platyrhynchos* Linnæus. Mallard

Breeds in practically all suitable places in the county. Abundant on the laguna near Eagleville in the fall of 1925.

15. *Mareca americana* (Gmelin). Baldpate

Breeding at Davis Creek in June, 1912, when two sets of eggs were taken, and noted in Surprise Valley in July of that year (Dawson, 1916, p. 24). Taken in Surprise Valley in the fall of 1926 by Academy field parties. Common during migrations according to local duck hunters.

16. *Nettion carolinense* (Gmelin). Green-winged Teal

Breeding at Clear Lake (Finley, 1911, p. 348). On several occasions in September, 1924, small numbers of this teal were noted in Surprise Valley by the Academy party. It was much

more numerous there in the fall of 1925, as the bodies of water were then of good size. Specimens were secured early in October.

17. *Querquedula cyanoptera* (Vieillot). Cinnamon Teal

Commonly breeding in northeastern California. Clear Lake (Finley, 1911, p. 348). Tule Lake (Bryant, 1914, p. 230). I found it at Tule Lake, May 30, 1922; at Jess Valley in June, 1923, breeding in the irrigated meadows there; and one female was seen on May 31, 1925, at the fast drying-up laguna near Eagleville, acting as if it had young ones near by. As no trace of young could be found, it seemed most probable that they had been destroyed recently by some hawk or predatory animal. This species leaves very early for the south. A pair seen at Goose Lake in the middle of June, 1925 (James Moffit, MS).

18. *Spatula clypeata* (Linnæus). Shoveller

Recorded in a general way as an abundant winter visitant to suitable localities throughout the state and as remaining locally through the summer in small numbers, but apparently the only published record for Modoc County is one from Clear Lake (Finley, 1911, p. 348), undated, but the context indicates that the birds were seen after the nesting season. Duck hunting residents state that this duck breeds in Surprise Valley and is quite abundant in wet seasons.

19. *Dafila acuta tzitzihua* (Vieillot). American Pintail

Breeds commonly in suitable places and is present through the winter season, as reported by settlers. Noted by Academy parties on various occasions in Jess and Surprise valleys, both breeding and in the fall. Very numerous on the laguna at Eagleville in the fall of 1925.

20. *Marila americana* (Eyton). Redhead

Clear Lake (Finley, 1911, p. 348). Recorded as breeding on the north shore of Tule Lake (Bryant, 1914, p. 229). The

north shore of Tule Lake extends such a short distance into southern Oregon that it is not reasonable to suppose that such species of ducks as breed on the north shore would never cross the imaginary state line—something like ten miles away—into Modoc County. One was shot by Denver, of the Academy party, near Eagleville on October 4, 1925.

21. *Marila valisineria* (Wilson). Canvas-back

Clear Lake (Finley, 1911, l. c.). A small flock of ducks of this species was noted by Jack Malloch and myself, October 9, 1924, on a small reservoir a few miles east of Alturas. Some people passing by this reservoir reported having seen there some "white-bodied ducks with dark heads." We were fortunate in being able to approach within such short range of this flock as to make identification of its members an easy matter. Three individuals were noted by myself on October 2, 1926, on the long pond at Boyd's Springs, barely out of gunshot range. These were swimming among a lot of Coots and were carefully examined through field glasses. A heavy duck charge was expended upon them, but they were just too far away for effect. This species is rarely seen in the county, apparently.

22. *Marila marila* (Linnæus). Scaup Duck

Clear Lake (Finley, 1911, l. c.). Plentiful at Clear Lake in April, 1918 (Willett, 1919, p. 199). Willett states that this species and the following were positively identified by himself, but that he was unable, on account of their similarity at long range, to make any estimate of their relative numbers. Evening discussions around the stove in the general store in Eagleville developed the fact that this duck is commonly present in winters when Cameron Lake, close by, is full of water.

23. *Marila affinis* (Eyton). Lesser Scaup Duck

Noted at Clear Lake by Willett in April, 1918, with the above species. In the discussions referred to in the preceding paragraph, reliable duck hunters stated that they had noticed that there were two kinds of "bluebills" frequenting the lake

in wet winters, one smaller than the other and a little different. In all probability some of these smaller ducks were *M. affinis*, while the others may have been of the following species.

24. *Marila collaris* (Donovan). Ring-necked Duck

Three pairs were observed at close range with field glasses at the mouth of Willow Creek, Clear Lake, on April 6, 1918 (Willett, 1919, p. 199).

25. *Charitonetta albeola* (Linnæus). Buffle-head

Female seen at Clear Lake, April 7, 1918 (Willett, 1919, p. 199).

26. *Erismatura jamaicensis* (Gmelin). Ruddy Duck

Clear Lake (Finley, 1911, l. c.). Eight individuals were noted on the north shore of Tule Lake and an egg of this species was discovered in the nest of a *Marila americana* on June 2, 1914 (Bryant, 1914, p. 230). As in the cases of the two species of Scaups above mentioned, this record seems logically applicable to Modoc County. This species of duck, however, was not known to residents of Surprise Valley. One was shot by a hunter on October 12, 1925, at the laguna near Eagleville, and brought to me for identification. Six individuals of this species were noted at Menlo Baths October 1, 1926, and one hornotine was secured, for the record.

27. *Chen hyperboreus hyperboreus* (Pallas). Snow Goose

Four birds seen at Clear Lake, April 6, 1918 (Willett, 1919, p. 199). Two individuals noted by Academy party on October 1, 1926, among a large flock of *Branta* that were sunning themselves along a small stream that still had in it enough water to reach a little way into the sandy bed of Lower Lake, about three miles southeast of Eagleville, where there was no way of approaching within gunshot of the flock.

Residents of Surprise Valley say that in former years, before the soil of the valley had been impoverished by con-

tinuous cropping and over grazing, and before the series of dry years that have been recently occurring, this goose came into the valley in winter in great numbers, and did considerable damage in the grain fields. There is comparatively little grain now sown there, but the Snow Goose is still to be found in fall and winter, though in sadly reduced numbers.

28. *Anser albifrons albifrons* (Scopoli).

European White-fronted Goose

"About twenty-five birds seen at Clear Lake April 5, [1918]" (Willett, 1919, p. 199). Winter visitant. Common in Surprise Valley in wet winters.

29. *Branta canadensis canadensis* (Linnæus). Canada Goose

Breeds extensively at Clear Lake. Forty-six nests examined by Willett at the time of his visit in 1918, most of the nests containing from four to seven eggs, a few with more than that number, possibly the product of two females (Willett, 1919, p. 199). Many nearly full-grown young, with 16 adults, were seen on a pond a mile west of Davis Creek post-office, June 12, 1925 (James Moffitt, MS). Bands of geese of this genus were noted by Academy parties in the fall of 1924 and 1925, many, if not all, of which being probably of this species. Unfortunately none was secured for identification, as they were extremely wary. This species breeds to some extent at Goose Lake. Nesting at Tule Lake, June, 1918; eggs there secured by Dr. John Van Denburgh are in the Academy collection. Reported by residents to be common during migrations, with every probability of other subspecies being present at such times.

30. *Branta canadensis minima* Ridgway. Cackling Goose

This goose is commonly recognized by hunters of the county and is present in favorable winter seasons, but as yet is of undetermined status as regards numbers present and duration of visits. From Tule Lake there are nine records of banded birds secured in October, November, and December, 1924

(Lincoln, 1926, pp. 155-156). On October 15 the first of these birds was taken definitely in Modoc County, while the other "points of capture" are well distributed around the shores of the lake. These nine geese had been banded in July, 1924, near the mouth of the Yukon River, by O. J. Murie and Herbert W. Brandt.

31. *Cygnus columbianus* (Ord). Whistling Swan

Reliable local authorities state that swans are very plentiful in Surprise Valley at times when there is water in the lakes, arriving in November and remaining until March. They do not always wait, however, for much water, as, according to Messrs. James A. and Frederick Street, great numbers were present in Surprise Valley in the winter of 1925-6, when there was so little feed, on account of drought, that a large percentage of the swans died from starvation, disease, or the effects of alkali, possibly. Mr. Frederick Street caught one swan and put it in his yard in Eagleville, where it lived for several weeks and became quite tame, but finally died. As the swan had been eating well at first, it looked very much as if its death had been caused either by disease or alkali poison.

32. *Plegadis guarauna* (Linnæus). White-faced Glossy Ibis

Goose Lake, June 10, 1912, several individuals noted (Dawson, 1923, p. 1925). The "black curlews" reported by hunters as having occasionally been seen in Surprise Valley must belong to this species.

33. *Botaurus lentiginosus* (Montagu). Bittern

Summer visitant, of wide-spread distribution. On June 13, 1923, I watched with much interest an individual that we came upon suddenly in Jess Valley, as it "froze" into the remarkable and characteristic resemblance to a wooden stake sticking up out of the swamp grass. Had we not seen it a few seconds before it assumed this pose, we should have passed it by, a few yards distant, absolutely unnoticed. It

remained immovable for about ten minutes as we watched it, and then suddenly faded from sight as our attention was distracted by something else. One flushed at 20 yards at Menlo Baths on October 1, 1926, but I was stalking some ducks at the moment, in order to identify the species, and so did not secure the Bittern.

34. *Ardea herodias hyperonca* Oberholser.

California Great Blue Heron

About 100 great blue heron nests were noted on islands in Clear Lake in early April, 1918 (Willett, 1919, p. 200). Some of these nests contained full complements of eggs by April 6. Reported by reliable residents of Surprise Valley to be seen there at times, but not noted by Academy parties. Two herons were secured by Academy parties on the Pit River, between the Pit River Forest Service Station and Canby in September, 1926. They are both birds-of-the-year and are too dark to be within the limits of *treganzai*. Logically *hyperonca* should be the subspecies found in this part of the county, as it would be perfectly natural for the heron, in its search for food, to work its way up the Pit River, which is a tributary of the Sacramento River along which it is commonly found. It does not follow, however, that another subspecies may not be found in the lake region of the north-western part of the county which is separated from the Pit River Valley by quite a stretch of unwatered desert country.

35. *Chasmerodius egretta* (Gmelin). Egret

Summer visitant, formerly in numbers (Henshaw, 1879, p. 2301), but now apparently very rare. "A few" were reported as breeding at Clear Lake in 1911 (Finley, 1911, l. c.).

36. *Nycticorax nycticorax nævius* (Boddaert).

Black-crowned Night Heron

Summer visitant. Specimens from Modoc County in the Museum of Vertebrate Zoology. A pair noted at Clear Lake, April 10, 1918 (Willett, 1919, p. 200). Noted by the Acad-

emy party at Willow Ranch, Goose Lake, where it was nesting in May, 1923, and one specimen was taken near the Pit River Ranger Station, August 29, 1926.

37. *Grus canadensis* (Linnæus). Little Brown Crane

Spring and fall migrant. Possibly a few winter in the county. In 1924 the Academy party arrived in Eagleville on September 5, and two days later cranes were noted flying in small bands over the nearby meadows, but probably some were already there at the time of our arrival. Other bands came in and some of them remained to feed on the grain in the stubble fields, evidently preferring wheat to the other grains.

These birds are very wary and seldom alight to feed in the vicinity of cover large enough to allow the unseen approach of a human enemy or of even a well-meaning observer. However, before the end of September frequent attempts to approach feeding bands had given me enough experience to make me believe that it was possible to distinguish the *canadensis* from *mexicana*. Old residents accustomed to duck and goose shooting in Surprise Valley call the *Grus canadensis* the "Little Blue Crane" or the "Turkey-foot", and claim that it always maintains a certain aloofness from *G. mexicana*. My own observations seem to confirm this hypothesis, as far as it is possible to judge of size through field glasses. In fact, it was my having observed bands of what appeared to be smaller cranes feeding in the stubble fields not joining or mixing with other bands near at hand, apparently composed of larger individuals, that led me to discuss the matter with resident hunters. These hunters claimed that they could readily recognize the two species by the differences in habits as well as the difference in size. The hunters had often been on horseback among the cranes, which sometimes allow a horseman to come relatively near them, and were in a better position to judge of this matter than was I. The birds vary a good deal at different times, often being just about as difficult to approach on horseback as on foot. On several occasions ranchmen unwittingly put to flight flocks of cranes when we had managed to crawl up almost within shooting range.

On October 7, 1924, a female bird-of-the-year was secured. It weighed six pounds nine ounces (2.98 kilograms).

There were more cranes in the Surprise Valley meadows in the fall of 1925 than there were the previous year, and much more stubble for them to feed upon, but fortune did not favor us and only one bird of this species was secured. This proved to be an adult male, which weighed nine pounds one ounce (4.1 kilograms).

38. *Grus mexicana* (Müller). Sandhill Crane

Summer visitant, possibly remaining late in the fall, but so many migrants come in to the county in the end of August or beginning of September that there is no way of knowing whether the breeders linger late, or depart early and are replaced by others from farther north. Henshaw (1897, p. 2301) states that "these large birds are so numerous in so many portions of Nevada, California, and Oregon that it is scarcely worth while to particularize localities." This state of affairs is now sadly changed by the encroachment of human beings upon the natural breeding grounds, the reclamation of marsh lands, etc. However, the cranes yet nest to some extent in the county. A nest containing pieces of eggshell was found by myself at the laguna near Eagleville on May 27, 1924, and two young birds from different nests were noted (Mailliard, 1924, p. 216).

This crane migrates in considerable numbers through Surprise Valley in the fall, pausing for some weeks to feed on the scattered grain in the stubble fields, and the general remarks upon *Grus canadensis* apply equally well to this species. Its numbers in the fall of 1924 were less than customary, according to the statements of residents, presumably on account of the then prevailing drought. On September 17, a female bird-of-the-year was secured, the weight of which was nine pounds 14 ounces (4.49 kilograms), and on October 1, 1924, an adult male was taken, weighing 11 pounds 13 ounces (5.31 kilograms).

In 1925 and 1926 a much larger representation was in evidence. On the morning of September 7, 1926, Gilmore (a member of the Academy party), with a 22-caliber rifle,

wounded a male bird-of-the-year which flew off about 200 yards and tried to hide in some weeds. When the flock arose, another crane, which afterwards proved to be an adult female, accompanied the wounded one and stayed by it while Gilmore approached and secured both of them at short range. This conduct seems to indicate that the female parent crane remains attached to its young for a considerable period after the nesting season.

39. *Porzana carolina* (Linnæus). Sora

There does not seem to be any published record for this rail in Modoc County. Henshaw (1879, p. 2302) gives it as being common throughout the summer, although not so numerous as *Rallus virginianus*, but gives no definite locality. However, we have in the Academy collection a set of eggs of this bird, from near Alturas. This set was taken by Dr. Barton Warren Evermann, director of the Museum, on June 9, 1918, while he was on a collecting trip with the late Dr. John Van Denburgh and Mr. Joseph R. Slevin, curator and assistant curator, respectively, of the Department of Herpetology. In his notes of this trip Doctor Evermann mentions this species as having been seen on other dates as well. It is given by other authorities as being common throughout the state in summer time, but again no definite reference to north-eastern California.

40. *Fulica americana* Gmelin. Coot

Breeding commonly in suitable places throughout the county. Possibly resident to a greater or less extent.

41. *Lobipes lobatus* (Linnæus). Northern Phalarope

Probably a straggler or casual migrant. Noted at Goose Lake, June 24, 1912, and Surprise Valley, July 12, 1915 (Dawson, 1916, p. 25). On October 3, 1926, three individuals were secured by the Academy party at the southern end of Surprise Valley just inside the southern line of Modoc County.

42. *Steganopus tricolor* Vieillot. Wilson's Phalarope

Summer visitant to suitable places in northeastern section of the state (Grinnell, 1915, p. 48). Breeds sparingly at Goose Lake (Dawson, 1923, p. 1184). Noted by the Academy party in May and early June, 1924, at the laguna near Eagleville, where drought conditions prevented it from nesting. Several pairs of these phalaropes stayed for some time in the vicinity of the laguna and were even seen feeding by the roadside in a shallow ditch that held an inch or two of water from a spring near by. By the middle of June they disappeared, as about all the water in the vicinity had dried up.

43. *Recurvirostra americana* Gmelin. Avocet

"Common summer visitant to the Modoc (plateau) region . . ." (Grinnell, Bryant and Storer, 1918, p. 339). Noted by the Academy party in May and June, 1924, at the southern end of Surprise Valley, where there yet were some swampy places and meadows irrigated in spite of prevailing drought conditions. From their actions these birds must have been nesting, but no attempt was made to find their nests, as the country was large and the birds few. The only fall occurrence noted was on October 2, 1926, when five individuals of this species flew over my head at the ponds of Boyd's Springs and settled down in shallow water in the middle of the smaller pond. According to residents of Surprise Valley, this species used to nest in large numbers in favorable seasons.

44. *Himantopus mexicanus* (Müller). Black-necked Stilt

"Common summer visitant to interior localities . . . chiefly east of the Sierras at the north, . . ." (Grinnell, 1915, p. 49). Henshaw (1879, pp. 2296, 2297) remarks upon the presence of this species and the foregoing in *all* of the territory covered by the field parties west of the Rocky Mountains, except in the highest mountain districts. "Common summer resident in the Modoc district" (Dawson, 1923,

p. 1204). Apparently Stilts were very numerous in the days before the lakes went dry, and they nested in Surprise Valley on the same ground as did the Avocets, the nests intermingled indiscriminately. In the recent droughts the nesting grounds have been greatly restricted and are probably confined to the vicinity of the large lakes that never go dry.

45. *Gallinago delicata* (Ord). Wilson's Snipe

Migrant through the state and commonly breeding in the meadows of Modoc County. Frequently noted by Academy parties in nesting seasons of 1923 and 1924, when many individuals were seen perched on top of fence posts along the roads, and heard, particularly at night, going through their aerial courting performances.

46. *Pisobia minutilla* (Vieillot). Least Sandpiper

Two were noted at Clear Lake, April 10, 1918 (Willett, 1919, p. 202).

47. *Limosa fedoa* (Linnæus). Marbled Godwit

A female was shot on the laguna near Eagleville on October 11, 1925, by William Barnes, a local hunter, to whom and to other sportsmen of Surprise Valley it was an unknown species. The specimen was presented to me and is now in the Academy collection. It probably is the first specimen on record as taken in California east of the Sierras.

48. *Totanus melanoleucus* (Gmelin). Greater Yellow-legs

This species is a migrant over the state generally, but probably is very sparingly so in the northeastern part. Dawson (1916, p. 25) gives a record for Eagleville, June 30, 1912.

49. *Catoptrophorus semipalmatus inornatus* (Brewster).

Western Willet

Common migrant in spring and fall. Breeds to some extent in the county. Vicinity of Goose Lake (Mus. Vert. Zool.). Nesting in Surprise Valley in May and June, 1924 (Mailliard, 1924, p. 216), judging from the actions of the birds when we were in the meadows, both at the southern end of Middle Lake and at the southern end of the valley.

50. *Actitis macularia* (Linnæus). Spotted Sandpiper

This sandpiper is known to breed in the lake region of northeastern California (Grinnell, Bryant and Storer, 1918, p. 432). The only time we noted the species in Modoc County was on May 27, 1923, when I found one or two individuals on the shore of Cave Lake, at an altitude of about 7000 feet. During the few hours passed there, it snowed a good part of the time, and some people fishing around the little lake disturbed the birds. I saw a Spotted Sandpiper flitting along the shore, often alighting close to me, but whether there was only one present, or more, I could not find out. Davis Creek, near Goose Lake, noted, June 12 (James Moffitt, MS).

51. *Numenius americanus* Bechstein. Long-billed Curlew

Common spring and fall migrant. Breeds in suitable places. Noted at Goose Lake in June, 1910 (W. P. Taylor, MS). We found it nesting in Surprise Valley in May and June, 1924, both near Eagleville and at the south end of the valley. The young were hatched by the time we came across this species. A ditch tender reported that between May 20 and 25, he had found a nest with four eggs, but by the time he showed us the nest, June 9, the young had hatched out and left.

52. *Oxyechus vociferus vociferus* (Linnæus). Killdeer

Summer visitant. Common in all favorable localities. A few remain through open winters, according to reports.

April 27, 1927

53. *Charadrius nivosus* (Cassin). Snowy Plover

The only record that I know of for the county reads, "Of regular occurrence at Goose Lake and manifestly breeding (or trying to do so; . . .)," in June, 1912 (Dawson, 1916, p. 26).

54. *Oreortyx picta plumifera* (Gould). Plumed Quail

Common resident in many parts of the county in suitable association, but rapidly becoming scarcer. At Deep Creek the Academy party noted quite a number in 1923, but in September, 1924, Ranger Ben Johnson stated that in that summer there was only one small band in the cañon, this band consisting of a pair of adults and 12 young ones. This covey, he said, frequently came into the station yard to eat food put out for them, but an overnight visit to the station and a trip some distance up the cañon failed to reveal to us the presence of any of these birds. The Buck Creek Ranger Station was visited by Academy parties both in 1923 and 1924. In the former year there were quite a few of these quail about the station in the spring, but in June, 1924, one juvenile, accidentally caught in a mouse trap, was the only one seen and none was heard calling. Ranger Lawrence Smith told me that quite a number come down from the higher ranges in the fall to the level of the station (5000 feet).

On the other hand, this bird was fairly numerous in the fall of 1926, at least in Surprise Valley, after a temperate winter and spring most favorable for nesting and raising young. There was even a flock of these quail living and feeding in the kitchen gardens of Eagleville. Some residents believed that the severe drought and consequent scarcity of water on the Nevada side of the valley, just east of which is an extensive game refuge in the sage-covered mountains, had driven many of the game birds over the state line and to the west and better watered side of the valley.

55. *Lophortyx californica vallicola* (Ridgway). Valley Quail

Common resident and much more numerous than the preceding species. On the Warner Mountains it ranges up to

6000 feet and over. The nesting season in this region seems to be prolonged late into the fall, for so late as the first week in October, 1925 and 1926, I noted several broods of very young birds, some of which could not have been over two weeks old.

For the same reason as given in the case of the preceding species, this quail was very abundant in 1926, so much so in places as seriously to interfere with the banding of sparrows that was being carried on. This species of quail was introduced into Surprise Valley some few years ago, presumably from the west side of the Warner Mountains, by an enthusiastic sportsman, and have increased to a remarkable extent when it is considered that in severe winters a very large percentage of both this species and the preceding is destroyed through inability to procure food when the ground is covered by deep or frozen snow.

56. *Dendragapus obscurus sierræ* Chapman. Sierra Grouse

Resident at considerable elevation in the coniferous forests along the Warner Mountains. The notes of the 1910 field party from the Museum of Vertebrate Zoology show that this bird was scarce even at that time, as but few were encountered. Old residents of the county state that it is rapidly becoming scarcer. The destructiveness of man in addition to its natural enemies evidently is making too strong a combination to permit it to maintain itself. The Western Goshawk (*Astur atricapillus striatulus*) seems to be one of the most destructive of its enemies. This hawk is comparatively numerous in the mountains and is reported to be exceedingly clever in its method of attack upon the grouse.

57. *Pediocetes phasianellus columbianus* (Ord).

Columbian Sharp-tailed Grouse

Henshaw (1879, p. 2295) says, "About Camp Bidwell, Cal., the 'sharptails' are sufficiently numerous to afford excellent shooting, and good bags may be made there." At present this species is here practically or actually extinct. During

our stay in Eagleville, in 1924, there were some rumors to the effect that one or two small bands had been seen in Modoc County within the previous two or three years, but nothing authentic was learned in regard to this.

58. *Centrocercus urophasianus* (Bonaparte). Sage Hen

This species was also at one time a very abundant resident of Modoc County, but now its numbers are sadly depleted, although reported by residents to have been fairly numerous up to a recent date. In the dry year of 1924, it seemed to be especially scarce, as repeated efforts on our part failed to reveal more than two or three very small bands within ten or 12 miles of Eagleville, in the particular habitat of this grouse. In 1925 there appeared to be more of them on the ranges, as, for instance, a band of about 300 birds was reported to me as having been flushed in a place where only a small flock had been found the year before. These birds were reported to be more numerous in 1926, because of favorable weather conditions during the preceding winter and spring. On the very edge of Eagleville a small flock of Sage Hens had located in the meadow land in the late summer. This seemed to be a strange sort of habitat for this genus, but the band probably had wandered over from the sage brush on the parched Nevada side of the valley. Much of the increase noted above may have been due to an invasion of this sort.

59. *Zenaidura macroura marginella* (Woodhouse).

Western Mourning Dove

Common resident over the plateau region of northeastern California. Noted by the Academy parties in about every place visited except the forests of the higher mountain ranges.

60. *Cathartes aura septentrionalis* Wied. Turkey Vulture

Common except in late fall and winter, but apparently not very abundant. Earliest seasonal date noted by Academy parties was May 9, and the latest about September 20.

61. *Circus hudsonius* (Linnæus). Marsh Hawk

Commonly found in summer over all of the meadow lands and marshes. In September, 1924, the season of great drought, it was frequently seen hunting over large sagebrush areas. One individual was taken by the Academy party on June 9, 1924, at an elevation of about 6000 feet, on top of a chaparral ridge, near Happy Camp Forest Service Station, where apparently it was hunting for sparrows or other small birds.

62. *Accipiter velox* (Wilson). Sharp-shinned Hawk

Winter visitant, with possibly a few resident in the mountains below the Boreal zone. Occasionally noted in Surprise Valley by the Academy party in the fall of 1924 and 1925.

63. *Accipiter cooperi* (Bonaparte). Cooper's Hawk

Found by the Museum of Vertebrate Zoology field party to be breeding at a considerable elevation on Parker Creek in 1910, the record being supported by specimens secured. Apparently not numerous in the county, as this hawk was not at any time identified by Academy field parties.

64. *Astur atricapillus striatulus* Ridgway. Western Goshawk

Breeds in the Boreal zone on the Warner Mountains (Mus. Vert. Zool.). Possibly some pass the winter at lower levels in the county. Several individuals were seen and specimens secured by the Academy party near Eagleville in September, 1924, they apparently having come down from the mountains. An adult female was taken on September 22, on the mountain side in Emerson Cañon, while devouring a Sierra Grouse that it had caught, and of which there was but little left at the time the hawk was shot.

65. *Buteo borealis calurus* Cassin. Western Red-tail

Common resident in Upper Sonoran and Transition zones, rather numerous in places.

66. *Buteo swainsoni* Bonaparte. Swainson's Hawk

Henshaw (1879, p. 2292) speaks of this hawk being abundant in summer in northern California, and, to judge from the context of the report, Modoc County must have been included in this territory, as much work was done there. Goose Lake, June, 1912, apparently nesting; also birds seen near crest of Sugar Hill (Dawson, 1916, p. 26). Noted southeast of Tule Lake on May 18, 1918 (Grinnell, MS). This hawk was not noted by Academy parties until the fall of 1926, when one was shot four miles west of Alturas on September 1, another was secured at Eagleville on September 4, and several more were seen in the next few days, but none appeared after September 12.

67. *Archibuteo ferrugineus* (Lichtenstein).

Ferruginous Rough-leg

"A hawk was seen in northeastern California which I believe to be of this species" (Henshaw, 1879, p. 2293). Sight records by Academy field parties at the head of Deep Creek Cañon and in Jess Valley, May and June, 1923 (Mailliard, 1924, pp. 213-4). On September 18, 1924, in a stubble field just east of Eagleville, two adult birds of this species, in very light phase, soared over my head just out of gunshot range, circling higher and higher after they noticed my presence. I had the same experience with what seemed to be the same two hawks in the same field one day in September, 1925. At other times this species had been noted in Surprise Valley under conditions not quite so satisfactory for identification as in the two cases just mentioned, but sufficiently so as to leave no doubt in my mind as to the species.

In the fall of 1926, with two assistants, I made even more especial efforts to procure a specimen. Several individuals were seen at different times, but the constant persecution of all large hawks by farmers and boys made approach in most cases out of the question. However, after several encounters that should have been successful, but were not, a fine male fell before my rifle on October 2, seven miles north of Eagleville. This seemed to break the spell, for my assistants

secured another male in Surprise Valley on October 6, and we picked up yet another on the highway on October 7, about a mile west of Pittville, just at the eastern edge of Shasta County. This bird evidently had been shot by some passer-by a day or two before and left lying in the hot sun, but a leg and foot was taken as a record for that county.

68. *Aquila chrysaetos* (Linnæus). Golden Eagle

Common resident in suitable localities, but not numerous. Noted by the Academy party at Pit River Forest Service Station on June 1, 1923, and at Eagleville on September 6 and 18, 1924. On this latter occasion one of these eagles circled over my head at close range so soon after the Ferruginous Rough-legs had done so that all three of the birds were circling around at the same moment. On September 17, 1925, we passed an immature bird that was sitting on a fence not 50 yards from our car. In 1926 several individuals were noted at various times. On October 2, three were in sight at once between Lake City and Boyd's Springs.

69. *Haliaeetus leucocephalus leucocephalus* (Linnæus).

Bald Eagle

Two individuals were seen at Clear Lake, April 8, 1918 (Willett, 1919, p. 203).

70. *Falco mexicanus* Schlegel. Prairie Falcon

Common near Camp Bidwell (Henshaw, 1879, p. 2292). Judging from the number of times this falcon was noted by Academy parties, it must be a common resident in the Transition zone on the eastern side, at least, of the Warner Mountain range. In May and June, 1924, one was occasionally seen looking for food in the meadow land of Surprise Valley, always giving the impression that it had come from the foothills of the range. One was obtained near Eagleville on September 22, 1924, and to quote from my field notes of the following day, I saw "two Prairie Falcons together right over Main Street in town [Eagleville] this morning, flying

low. Good many about." It was also noted on different occasions in the fall of 1925, but there were not so many as in the previous year. Often noted in Surprise Valley in the fall of 1926. Seen often in the Warner Mountains and on Warren Peak in June and July, 1912 (Dawson, 1916, p. 26).

71. *Falco columbarius columbarius* Linnæus. Pigeon Hawk

On September 6, 1924, I saw a falcon that I took to be of this species, just out of gunshot range at the southern end of Surprise Valley. A female was shot by a schoolboy of Eagleville, September 24, 1925, and brought to me to add to our collection. Another one was noted near Eagleville in late September, 1926.

72. *Cerchneis sparveria sparveria* (Linnæus).

American Sparrow Hawk

Common over most parts of the county, at least from early spring until late fall. Probably some remain through ordinary winters in the more favorable localities. Several specimens were secured.

73. *Pandion haliaëtus carolinensis* (Gmelin). Osprey

"Present on nearly all the streams and lakes that furnish fish" (Henshaw, 1897, p. 2293). Goose Lake, June 17, 1912, one bird seen (Dawson, 1916, p. 26). "Pairs of birds seen daily at Clear Lake" (Willett, 1919, p. 204). Found by the Academy party to be nesting on the South Fork of the Pit River in June, 1923, near the Pit River Forest Service Station. The nest was in the top of a tall pine on a hillside on the south side of the river some distance away, but the birds could be recognized from the station even without the aid of field glasses. Ospreys were seen in the same locality in August, 1926, during our stay at the forest service station.

74. *Tyto alba pratincola* (Bonaparte). American Barn Owl

Resident. Rather common at Fort Bidwell (Henshaw, 1879, p. 2291). None were met with, as it happens, by Academy parties, but this owl was reported by residents to be found often in the tangled willow thickets along streams in the meadow lands of Surprise Valley. An adult was secured near Eagleville by Mr. James A. Street, and sent in the flesh to the Adacemy, November 18, 1926.

75. *Asio wilsonianus* (Lesson). Long-eared Owl

Noted at Goose Lake, two immature birds secured June 5, 1910 (Mus. Vert. Zool.). This owl was seen several times in Surprise Valley in the fall of 1926. Two were secured near Eagleville, and on September 30, I flushed a family group in a small rocky gully in the sagebrush desert on the eastern side of Middle Lake and secured two of the immature birds.

76. *Bubo virginianus occidentalis* Stone. Pale Horned Owl

Resident. There are two young birds in the Museum of Vertebrate Zoology that are doubtless of this subspecies, though they were originally catalogued as *pacificus*, one taken at the head of Pine Creek, Warner Mountains, and the other at the Scott ranch, ten miles north of Alturas, in July, 1910 (Swarth, 1921, p. 136). In the collection of the California Academy of Sciences there is an adult male from the Warner Mountains, taken by John Rowley, September 24, 1913, and another male that was brought to me from two miles north of town by an Eagleville schoolboy on October 7, 1925. Both of these specimens I have confidently placed in the category of *occidentalis*, not as typical of this race, but as being decidedly nearer to it than to *pacificus*. Inhabitants of Surprise Valley stated that horned owls come down from the mountains in the fall and return to the higher timber early in the spring for the nesting season, after having passed the winter in the lowlands of the county. Most probably this is the owl recorded, erroneously under the name of *pallescens*,

as nesting at Clear Lake, with two nearly incubated eggs in the nest on April 7, 1918 (Willett, 1919, p. 204). In 1926 this owl also was more numerous in Surprise Valley than had previously been my experience. Two were secured, one of them taken in the town of Eagleville, and several others were noted by our party.

77. *Speotyto cunicularia hypogæa* (Bonaparte).

Burrowing Owl

Resident, but not numerous (Mus. Vert. Zool.). Two noted in Surprise Valley "back of Dyke's barn," which must have been near the mouth of Granger (Dry) Creek cañon. Present in Surprise Valley in the fall of 1924 and 1925, but scarce. One specimen was secured in September, 1926, near Eagleville.

78. *Glaucidium gnoma*, subspecies

On September 20, 1922, "the typical notes of a pigmy owl" were heard at dawn at Steele Meadow (Grinnell, MS). Doctor Grinnell is too well versed in bird notes to allow of much doubt as to the species of the originator of those notes. Soon after daylight on the morning of August 31, while we were in camp at the Pit River Forest Station, a pygmy owl commenced to call on the partly wooded hillside above us. The attention of the rest of our party was called to this fact, but we failed to locate the tree from whence came the sound before it ceased and was not resumed. Search for the bird was unsuccessful.

79. *Ceryle alcyon caurina* Grinnell.

Northwestern Belted Kingfisher

Noted at Davis Creek, Dry (Granger) Creek, Parker and Payne creeks, in June, July, and August, 1910 (H. C. Bryant and W. P. Taylor, MSS). Several seen at Steele Meadow, September 30, 1922 (Grinnell, MS). Individuals were noted in the fall of 1926, fishing along the Pit River, below Canby.

80. *Dryobates villosus orius* Oberholser. Modoc Woodpecker

Resident in suitable places throughout the county. Noted by Academy parties at every place visited.

81. *Dryobates pubescens homorus* Cabanis & Heine.

Batchelder's Woodpecker

Warner Mountains (Mus. Vert. Zool.). Recorded as a summer visitant to these mountains (Grinnell, 1915, p. 77). Apparently it is not numerous anywhere. At the end of May, 1924, a pair was nesting in a tall cottonwood across the road from our quarters just north of the town of Eagleville. Only two specimens were secured by Academy parties in the spring, but several were taken near Eagleville in the fall, when there appeared to be a slight vertical migration to the floor of the valley.

82. *Xenopicus albolarvatus albolarvatus* (Cassin).

White-headed Woodpecker

Resident on the Warner Mountains (Grinnell, 1915, p. 79). We did not come across this species at the lower levels visited, say, at 4500 to 5000 feet, but it probably is to be found there in some of the pine forests of the county, as this seems to be a favorite altitude for it elsewhere.

83. *Picoides arcticus* (Swainson).

Arctic Three-toed Woodpecker

Resident on the Warner Mountains (Grinnell, 1915, p. 79). One male was taken by the Academy party at Red's Camp, 12 miles southwest of Eagleville on September 16, 1926.

84. *Sphyrapicus varius nuchalis* Baird. Red-naped Sapsucker

Very common in suitable localities in Transition and Canadian zones. Nesting in many of the places visited by the Academy parties. One nest examined by myself, in a willow

tree on the bank of a small stream in Jess Valley contained young three or four days old on June 14, 1923. Numerous in Eagleville during September and early October, at least in 1924 and 1925. It was noticeable that a rapid increase in numbers took place after heavy snow covered the higher altitudes of the Warner Mountains. While commonly met with in September and October, 1926, this species was present in much smaller numbers than we had previously found it. This might be accounted for by the insignificant snowfalls and the few storms of this fall.

85. *Sphyrapicus varius daggetti* Grinnell.

Sierra Red-breasted Sapsucker

Resident in small numbers on the Warner Mountains (Grinnell, 1915, p. 80).

86. *Sphyrapicus thyroideus* (Cassin).

Williamson's Sapsucker

Common in summer at the higher altitudes of the Warner Mountains (Grinnell, 1915, p. 80). Taken at 7500 feet elevation near Eagle Peak by both F. Tose and myself, in June, 1924.

87. *Asyndesmus lewisi* Riley. Lewis's Woodpecker

Resident. Commonly breeding in all suitable localities and scattering in the fall according to food conditions.

88. *Colaptes cafer collaris* Vigors. Red-shafted Flicker

Resident in all suitable places in the county.

89. *Phalænoptilus nuttalli nuttalli* (Audubon). Poor-will

Common summer visitant to Upper Sonoran and Transition zones. Warner Mountains (Grinnell, 1915, p. 83). Noted by myself in the Deep Creek cañon, near Cedarville, May 9-15, 1923, and specimens taken. Also at Eagleville in May, 1924.

I secured an adult male a few miles east of Eagleville in a rocky part of the desert, September 18, 1925, and another was taken near Eagleville, September 6, 1926.

90. *Chordeiles virginianus hesperis* Grinnell.
Pacific Nighthawk

Common summer visitant to a large area in Modoc County. Parker Creek, Sugar Mountain, Squaw Mountain, June and July, 1910 (H. C. Bryant and W. P. Taylor, MSS). Taylor (MS) reports that, at the time he was on the 1910 field work in Modoc County, he heard the notes of this bird at night as early as May 26, but the first sight record seems to be by Bryant (MS) on June 8. During several years' experience in field work at moderately high altitudes in northern California, the earliest date on which I have heard this nighthawk has been June 2. It was seen frequently at Eagleville in the latter half of September in 1924, 1925, and 1926, on the southward migrations.

91. *Archilochus alexandri* (Bourcier & Mulsant).
Black-chinned Hummingbird

Present in July in the mountains near Camp Bidwell (Henshaw, 1879, p. 2290). One specimen taken on August 5, 1910, by H. C. Bryant (Mus. Vert. Zool.). Warner Mountains, July 3 and 9, 1912 (Dawson, 1916, p. 27).

92. *Selasphorus rufus* (Gmelin). Rufous Hummingbird

Noted at Warren Peak, July 16 to August 9, 1910 (W. P. Taylor, MS, and specimens in Mus. Vert. Zool.). Noted by myself in Surprise Valley in September, 1924, and one specimen secured on September 13. There were quite a few around the wild rose bushes among the willows about two miles north of Eagleville, but they were practically impossible to retrieve in the dense growth, so that but one was taken. A female bird-of-the-year was taken at the Pit River Forest Service Station on August 31, 1926.

93. *Stellula calliope* (Gould). Calliope Hummingbird

Common summer visitant in all suitable places.

94. *Tyrannus tyrannus* (Linnæus). Kingbird

Rare summer visitant. Sight records at Pit River about eight miles above Alturas, June 15; Surprise Valley, near Eagleville, June 30, 1912 (Dawson, 1916, p. 27). An immature female was taken in the vicinity by myself on September 4, 1926. This was quite a young bird.

95. *Tyrannus verticalis* Say. Arkansas Kingbird

Common in Upper Sonoran and Transition zones in spring and early summer in all favorable localities. Noted by the Academy party as early as May 9, but it may have arrived even earlier. On several occasions it was observed to be nesting in pine trees, rather than in smaller trees of other varieties. A few remain until early September. A male adult was taken near Eagleville on September 7, 1926, and other individuals were noted during the next few days.

96. *Myiarchus cinerascens cinerascens* (Lawrence).

Ash-throated Flycatcher

An immature male of this species was taken by one of our party on September 3, 1926, at Eagleville. This seems to be the most northern record for California east of the Sierras.

97. *Sayornis sayus* (Bonaparte). Say's Phoebe

Breeds in the northeastern plateau region of California (Dawson, 1923, p. 874). Quite common in Surprise Valley in September, when specimens were secured by Academy parties.

98. *Nuttallornis borealis* (Swainson). Olive-sided Flycatcher

Summer visitant. Breeding on Warner Mountains (Mus. Vert. Zool.). Noted at Eagleville by the Academy parties in the fall and specimens taken.

99. *Myiochanes richardsonii richardsonii* (Swainson).

Western Wood Pewee

Summer visitant in all suitable places, even very high on the ranges. Earliest date noted by the Academy party was May 15 (1923) at Cedarville. Common in the fall, 1924-1925, from the middle of September well into October. Flycatchers were notably scarce in the fall of 1926, and none of this or of the following species was secured at that time.

100. *Empidonax difficilis difficilis* Baird. Western Flycatcher

Summer visitant. Breeding in Warner Mountains (specimens in Mus. Vert. Zool.). Not noted at any time by Academy parties.

101. *Empidonax traillii traillii* (Audubon). Traill's Flycatcher

Summer visitant. Goose Lake, May and June; Cedarville, August 8, 1910 (specimens in Mus. Vert. Zool.). Breeding in Jess Valley in June, 1923, and taken in Surprise Valley in September, 1924.

102. *Empidonax hammondii* (Xantus).

Hammond's Flycatcher

A male bird of this species was secured by myself at Cedarville on May 15, 1923, but none was positively identified at any other time or in any other place by Academy parties, and no other record found for Modoc County. However, it is so very difficult in the field to distinguish this species from the following, that one may easily overlook its presence among others of the small flycatchers. In fact, sight identifications alone of this species and the following, in places where both may occur, are practically valueless.

103. *Empidonax wrighti* Baird. Wright's Flycatcher

Summer visitant, widely distributed in the fall, but nesting mostly confined to the mountain ranges, as in the Warner Mountains (Mus. Vert. Zool.). The only time it was noted

in spring by an Academy party was June 18, 1924, when I took two at Happy Camp at about 5000 feet altitude. These were a male and female, but there was no indication of their being paired at the time. A few individuals, presumably of this group of small flycatchers were noted near Eagleville in the latter part of September, 1925. One specimen was secured on September 17, and another on the 18th, both being female birds-of-the-year. The few noted were quite wild.

104. *Empidonax griseus* Brewster. Gray Flycatcher

Summer visitant, but not abundant. South Fork of Pit River, near Alturas, June 9, 1910 (Mus. Vert. Zool., two specimens). From among the small flycatchers just mentioned above, I took a male of this species on September 18, 1925, at Eagleville.

105. *Otocoris alpestris merrilli* Dwight. Dusky Horned Lark

Common resident in suitable places (Grinnell, 1915, p. 95). The horned larks are early breeders, and we did not arrive in Modoc County until too late to find them nesting. In fact, but few were seen in the spring. On the east side of Surprise Valley, on June 11, 1924, I obtained a young bird, well able to fly, after chasing the family for a long way over a rocky part of the desert. They were exceedingly wild. In September, 1924 and 1925, small bands were often seen by Academy parties. They gathered around water holes to drink, principally in the desert region, where specimens were secured. The bands were more numerous and of larger size in 1924, when water was so scarce, than in the following year of greater rainfall, when the birds were more scattered in their flights. On several occasions small flocks were noted on the east side of the Warner Mountain range at about the limit of Upper Sonoran, say, 6000 feet, apparently in migration. The two adults taken in spring are appreciably paler than most of our specimens of similar date from Siskiyou County (California). No horned larks were noted in Surprise Valley in the fall of 1926.

106. *Pica pica hudsonia* (Sabine). Magpie

Common resident in suitable places over much of the county. Some of the nests noted by the Academy party were so low in willow groves that they could almost be reached from the ground. Nests with eggs and others with fledglings ready to fly were noted at Goose Lake at the end of May, 1923. Quite numerous in Surprise Valley. Many family groups were observed with much interest as the young acquired their juvenile plumage. We found that it did not take long for the young to learn to keep out of range of human beings who came near them.

There was a great increase in the jack rabbit population of Surprise Valley in 1926, probably due to scarcity of food on the Nevada side, and a consequent greater number of casualties among these animals, particularly from collision with automobiles traveling at night. Magpies appeared to have gathered to enjoy the resulting feast, and were especially numerous along the highways. One was found in one of the Potter traps used in banding operations. With it were two sparrows at the other end of the trap, one of them alive and the other headless, its head being inside the magpie.

107. *Cyanocitta stelleri frontalis* (Ridgway).

Blue-fronted Jay

Common resident of Modoc County wherever there are trees enough to make good cover. Quite widely distributed in the breeding season, but gathering in the fall where food is found to be most abundant. In September, 1924, this jay was so numerous in Eagleville as to be a pest in the many small apple orchards of the settlement. These orchards are small, for home supply only, and the inroads made by the jays upon the apple crop assumed serious proportions. With the crop limited as it was by the drought of that year, the owners of such orchards as were bearing fruit waged incessant warfare upon the jays, both of this species and of the following one. Hundreds were shot, but those that were left soon became expert in dodging their pursuers and the slaughter lessened. It was a surprise to find so many quite

immature birds among those shot in late September. That some migration takes place is certain. Mr. James Street reported to me that, while deer hunting high up on the Warner range, on September 28, 1924, he had seen a flock of 50 to 60 Blue-fronted Jays flying south along the mountain side. In the fall of 1925 there was so much food in the mountains that but few of these birds came down to the apple orchards in the valleys. For some unknown reason they were not at all numerous in the orchards in the fall of 1926, in spite of the fact that the following species was abundant.

108. *Aphelocoma californica immanis* Grinnell.

Long-tailed Jay

Common resident in many places, but strangely absent in other parts that seem well adapted to its existence. Very numerous in Surprise Valley in the fall of 1924, when it was as fond of apples as was the Blue-fronted Jay. Not found at high altitudes. On the morning of October 1, 1924, I saw about 25 Long-tailed Jays, in a scraggly band apparently in migration, working their way south through the cottonwoods along Eagle Creek, just back of Eagleville. This jay was not particularly noticeable in Surprise Valley in the fall of 1925, but the following year, which again was one of deficient rainfall, it was about as numerous as in 1924 and was very destructive to the apple crop.

109. *Perisoreus obscurus griseus* Ridgway. Gray Jay

Resident locally on mountains. Young in juvenile plumage taken near Camp Bidwell (Henshaw, 1879, p. 2286). Warner Mountains (Mus. Vert. Zool.). Several specimens were taken by the Academy party in the fall of 1926.

110. *Corvus corax sinuatus* Wagler. Raven

On September 14, 1926, four birds, which I at first thought were vultures, were noted in the northern distance soaring rather low. As I was occupied among the sagebrush, band-

ing sparrows, these birds approached until they were directly overhead, when I discovered that they were Ravens. They kept close together and with widespread tails soared in circles, probably looking for dead jack rabbits toward the south. On our way to Boyd's Springs, October 2, 1926, a Raven was seen on a fence post in the sagebrush east of Lake City, but it took flight before we were close enough for a shot.

111. *Corvus brachyrhynchos hesperis* Ridgway.

Western Crow.

Resident to some extent. Numerous at Sugar Hill, June 30, 1910 (W. P. Taylor, MS). Davis Creek, June 10; Eagleville, June 30, 1912 (Dawson, 1923, p. 16). Noted by the Academy party at Willow Creek Ranch, Goose Lake, in May, 1923, and in Surprise Valley in May and June, 1924, breeding freely in both places. In Surprise Valley flocks gathered in the stubble fields toward the end of September, 1924. At Eagleville the local band was joined by others, the maximum being reached about September 23, when some 500 individuals stayed all day about a freshly threshed straw stack. Quite a number remained for a few days in the vicinity, but on October 3 I noticed that the flock was greatly thinned out. In September, 1925, the crows gathered as they had in the previous year. The number seemed to reach the maximum about September 23, when I estimated the size of the band to be in the neighborhood of 1000 individuals, all feeding in the stubble field back of our quarters. Ten days after this, small numbers were noted moving toward the south, which movement continued daily until comparatively few remained on October 15, when our party left the field. In the fall of 1926 crows were not nearly so numerous in Surprise Valley as in the two previous years, probably because of diminished area of grain stubble. Quite a number appeared, but they did not band much together and seemed to be moving south in small, straggling flocks. It is reported that but few remain through the winter.

112. *Nucifraga columbiana* (Wilson). Clarke's Nutcracker

Common resident on the Warner Mountains (Grinnell, 1915, p. 100). Juveniles frequently seen and some taken on Warren Peak in June, 1910 (H. C. Bryant and W. P. Taylor, MSS, specimens in Mus. Vert. Zool.). Taken by Academy parties in the fall.

113. *Cyanocephalus cyanocephalus* (Wied). Piñon Jay

Noted May 10, 1918, southeast of Tule Lake (Grinnell, MS). On September 22, 1925, while busy at our quarters at Eagleville, my attention was attracted by the note of this bird, and I found that two individuals had just alighted on the ridge of a nearby barn. I jumped for a gun, but the birds flew by me at long range. One was brought down, but, as it was only winged, it managed to escape us in a bunch of heavy weeds before we could get over the two intervening fences. The other bird flew by out of range a couple of times, calling continuously, but, receiving no answer from its companion, it soon disappeared. The residents call this jay a "Jackdaw".

114. *Dolichonyx oryzivorus* (Linnæus). Bobolink

Summer visitant. The first published record of this species in Modoc County appeared in *The Condor*, Vol. XVIII, 1916, p. 28, where Mr. Leon W. Dawson mentions having come across a small breeding colony near Eagleville on June 30, 1912. That this colony is a permanent one seems to be now well established, for the Academy party found it in the same place in 1924 (Mailliard, 1924, p. 21), and residents of Surprise Valley stated that for many years the birds have been noticed there every spring. This seems to be the only part of the state visited by this species except as a rare straggler. Neither Dawson nor the Academy party actually found any nests, but there is little reason to doubt that the colony was nesting, or about to do so, when visited.

115. *Molothrus ater artemisiæ* Grinnell. Nevada Cowbird

Rare summer visitant to Modoc County (Grinnell, 1915, p. 101). There is a specimen in the Museum of Vertebrate Zoology, Berkeley, California, taken at Brewer's ranch, 10 miles north of Alturas, June 8, 1910, when several others were also seen (W. P. Taylor, MS). Resident of Surprise Valley mentioned having seen this bird among the cattle from time to time, and gave such a detailed description of the bird as to make the generic identification unquestionable.

116. *Xanthocephalus xanthocephalus* (Bonaparte).

Yellow-headed Blackbird

Breeds in suitable places, but is not resident. A number were noted in meadows near Goose Lake in May, 1923, and a few were found in Surprise Valley in 1924, in May and June. On September 10, 1925, near Eagleville, I saw two birds of this species among a large flock of other blackbirds.

117. *Agelaius phœniceus nevadensis* Grinnell.

Nevada Red-winged Blackbird

Common resident in suitable places. In September large flocks gather in the stubble fields, but they thin out very perceptibly by the middle of October. In 1925 these flocks of red-wings were of much greater size than were those of the previous year, being composed of thousands of birds, but in September, 1926, no very large flocks were seen. As with the crows above mentioned, this species appeared to be working south in comparatively small bands.

118. *Agelaius tricolor* (Audubon). Tricolored Red-wing

Noted in Modoc County in great numbers along the South Fork of Pit River, June 5, 1912 (Dawson, 1916, p. 28). Not noted in the county by Academy parties and no other record found. Incidentally, this red-wing is very uncertain in its local appearances.

119. *Sturnella neglecta* Audubon. Western Meadowlark

Common in all suitable localities in spring, summer, and fall, but not abundant. Probably some remain through a mild winter. These birds commence to band together by the end of September. On October 1, 1925, a flock of some 75 individuals alighted in a small field near where I was doing some bird banding.

120. *Icterus bullockii* (Swainson). Bullock's Oriole

Common summer visitant in many localities, yet absent from others where one would naturally expect to find it. Nests in the willows and cottonwoods along the streams and irrigation ditches and in the planted poplar trees. Our earliest record of arrival was May 9, but it might have come into some of the cañons a day or two earlier without our having come across it.

121. *Euphagus cyanocephalus cyanocephalus* (Wagler).
Brewer's Blackbird

Resident, but not at high altitudes. Common in limited numbers in all suitable places in the plateau region. Found nesting on the ground on top of the bank of a small stream at the Pit River Ranger Station, only a few rods from a tree- and bush-covered hillside. In September they gather in large flocks in the stubble fields with the crows. In 1925, especially, these blackbirds assembled in huge bands, almost as large as those of the red-wings. Some flocks contained both species, but the Brewer's Blackbirds associated more with the crows than with the red-wings. By October 15 most of the birds had departed.

122. *Hesperiphona vespertina montana* Ridgway.
Western Evening Grosbeak

Warner Mountains in summer (Grinnell, 1915, p. 106). In early spring we found this species scattered in small bands about the county, feeding on willow and cottonwood buds.

A small flock stayed in the cottonwoods by the Deep Creek Forest Service Station, May 11-14, 1923. A flock appeared in Eagleville on September 24, 1924, and was feeding on the ground in the street. Also noted in September at higher altitudes, where several were taken.

123. *Carpodacus purpureus californicus* Baird.

California Purple Finch

Parker Creek in June, 1910 (Mus. Vert. Zool.), and Steele Meadow, September 29, 1922 (Mus. Vert. Zool.). Noted by Academy parties in nearly every place visited, but never abundant.

124. *Carpodacus cassinii* Baird. Cassin's Purple Finch

Warner Mountains, resident (Mus. Vert. Zool.). Noted by the Academy party in Jess Valley (5000 feet) only, where it was nesting, in June, 1923. Although I was constantly on the lookout for this species during the several visits made to Modoc County, I failed to note it anywhere else.

125. *Carpodacus mexicanus frontalis* (Say). House Finch

Warner Mountain region (Mus. Vert. Zool.). Resident over much of the plateau. Noted nesting at Cedarville, Eagleville, and Jess Valley. Very abundant in Surprise Valley in the fall of 1924 and 1925, when large flocks were a common sight along the roads.

126. *Astragalinus psaltria hesperophilus* Oberholser.

Green-backed Goldfinch

Summer visitant. Evidently this finch was not much in evidence at the collecting stations of the Museum of Vertebrate Zoology party of 1910, although several individuals were noted at Sugar Hill on May 26, 1910 (W. P. Taylor, MS). It was noted by the Academy party in June, 1923, at the Pit River Forest Service Station and at Jess Valley, apparently nesting in both places. It was found by us at

Eagleville in small numbers toward the end of September, 1924, and it was quite numerous there in the fall of 1925 and 1926. Specimens secured.

127. *Spinus pinus* (Wilson). Pine Siskin

Summer visitant to the Warner Mountains (Mus. Vert. Zool.). A few pairs were noted by us at the Buck Creek Forest Service Station on May 25, and in Jess Valley in June, 1923. Small flocks were occasionally seen in Surprise Valley in September, 1924, and it was rather abundant there in the fall in 1925 and 1926.

128. *Passer domesticus* (Linnæus). House Sparrow

Several seen in the main street of Cedarville on September 12, 1924, as we were passing through in our car. None was noted during our stay in Surprise Valley in 1925, but a flock, estimated at 50 individuals, was feeding in the street of Adin as we passed through on October 15. I got out of the car and quietly approached to within 20 feet of the band before it took wing, when it flew into a garden bush close by. At Eagleville, September 21, 1926, a small band was seen in the street. House Sparrows were reported to have occupied an old barn on the main street of Eagleville for two or three years and then disappeared. It is rather interesting to know that these places are many miles from a railroad, which is supposed to be the line of extension of habitat of this sparrow, and are separated from one by mountain ranges.

129. *Poœcetes gramineus confinis* Baird.

Western Vesper Sparrow

Summer visitant, fairly common in the spring and very numerous in the early fall, at least, in Surprise Valley. By the end of September they have all left. A nest with four eggs was secured near Goose Lake on May 22, 1923.

130. *Poœcetes gramineus affinis* G. S. Miller.
Oregon Vesper Sparrow

An immature female vesper sparrow, taken at Steele Meadows by Dr. Joseph Grinnell on September 29, 1922, has been referred by him to this race. No other record.

131. *Passerculus sandwichensis alaudinus* Bonaparte.
Western Savannah Sparrow

A sparrow of this subspecies was taken at Eagleville on September 30, 1925, and another was secured there on September 21, 1926, these two being the only ones that were positively identified.

132. *Passerculus sandwichensis nevadensis* Grinnell.
Nevada Savannah Sparrow

Common in summer in suitable meadows throughout the county. It was quite abundant in parts of Surprise Valley during the spring of 1924, and was either migrating or gathering for migration in September, flocks of from 50 to 100 individuals being noted where there was good feeding ground. Several endeavors were made to obtain a number of specimens in such places to ascertain if there were present any other races of *Passerculus*, but the birds were so difficult to secure in such cover as the rather high grass afforded that not much success rewarded our efforts. However, close observation led me to believe that there were few, if any, other forms present. By October the diminution in numbers was very perceptible. In the fall of 1925 the numbers present of this sparrow did not increase until about September 17, after which date they were quite abundant for a week or so. Very few were seen in the fall of 1926.

133. *Chondestes grammacus strigatus* Swainson.
Western Lark Sparrow

Summer visitant. Sugar Hill, June, 1910 (Mus. Vert. Zool.). A few pairs seemed to be preparing to nest at Cedar-

ville in May, 1923, and at the Pit River Ranger Station, but the species seemed to be scarce as a rule. It was not met with in the fall by Academy parties and apparently leaves early.

134. *Zonotrichia leucophrys leucophrys* (J. R. Forster).
White-crowned Sparrow

Summer visitant to the higher elevations on the Warner Mountains (Mus. Vert. Zool.). Although a constant watch was kept for this bird on the floor of Surprise Valley (below 5000 feet) in the fall of 1924, no *leucophrys* was recognized. A better opportunity for determining its occurrence at the lower altitude presented itself in the fall of 1925, when I was trapping and banding numbers of *gambelii*, but none was taken. Contrary to this experience, this bird appeared in my traps in early September, 1926, when one was found in a trap on the floor of the valley on September 7. During the following week an occasional bird appeared, after which time no more were noted.

135. *Zonotrichia leucophrys gambelii* (Nuttall).
Gambel's Sparrow

A very abundant migrant in the fall and presumably equally so in the spring. It passes northward quite early in spring, and it appears that no collector has been on the ground until after the migration was practically over. Found to be extremely abundant in the fall of 1924, being present in limited numbers on September 3, the day of the arrival of the Academy party. The numbers increased rapidly for a week or so after this until there were more Gambel's Sparrows in evidence than I had ever seen anywhere before. The 17 miles between Eagleville and Cedarville seemed to have a flock of these sparrows every few rods along the road, wherever there was a sagebrush border. Had our party been prepared for such work, wholesale banding would have been an easy matter.

In the hope of finding conditions similar in this respect in 1925, Surprise Valley was revisited, with a banding outfit ready for work. A striking difference was found, however, in this year of normal rainfall as compared with the previous

year of great drought. Food and water were plentiful and the migrating birds were not so restricted in their choice of routes. In consequence of this, their numbers in Surprise Valley were far less. None was found until September 12, when one was secured and another seen. It was not until September 22, that enough of the sparrows had appeared to make it worth while to commence banding operations. With several interruptions caused by storms, etc., banding was kept up until October 10, by which time the sprouting grass seeds attracted the birds more than any bait offered to them, and so many had moved on southward that the work was discontinued. The banding was done by myself alone, with the following results: Adults banded, 200; immatures, 181; total, 381. In addition to this number there were 124 "repeats". Some of these repeaters came into the traps as many as three times in one day.

One of the main reasons for taking up fall work in Surprise Valley in 1926 was the checking up on returns of the sparrows of this species that were banded in 1925, particularly so because the season had been a dry one, much like that of 1924, when this sparrow was so numerous there.

In the 1926 fall field work, Modoc County was reached on August 28, and camp was made on the Pit River for a stay of a few days on the way to Surprise Valley. No sparrows of the genus *Zonotrichia* were noted at this time west of the Warner Range. In Surprise Valley the first were seen on September 2, when half a dozen were found in a hedge about two miles south of Eagleville. After this date the numbers rapidly increased until enough had appeared to warrant the commencement of banding operations on September 7, at the McCully ranch, two miles north of Eagleville. On this ranch was an ideal place in which to trap this sparrow, a spot where a large proportion of the banding of the previous year had been carried on. There were plenty of the sparrows here at this time, but there was so much weed seed, particularly that of a "pigweed", *Amaranthus*, that no bait that was offered proved much of an attraction. Later on this condition automatically bettered itself.

Three different banding stations were used and the traps moved from one to another as the ratio of repeats to new birds

taken became so large as to prove unprofitable in this "mass banding", until a new wave of migration came in. Two of these stations were quite close to Eagleville and both of them very nearly on a direct south line from the McCully ranch station, yet in no instance was a bird banded at one station picked up at another, which made it appear that when migrating birds left a resting place, they made a non-stop flight to another. Rather a small proportion of the birds that were banded came a second time into the traps, creating the impression that many of them made but a short stay in one spot in the height of the migration, their places as they left being filled by new arrivals. Yet a limited number evidently stayed on for a while, repeating after intervals of from two or three days up to a fortnight from the date of first capture, the latter being the case only among the first comers. Incidentally, some of the repeaters came many times into the traps, one of them appearing twice the first day, *six times* the third day, and, with two single entries, making ten visits in all inside of four days. The frequent moving of the traps from place to place, however, unfortunately interfered with close observation of arrivals and departures as would be indicated by such repeats, for, as soon as the "repeats" exceeded the number of new birds coming into the traps, operations were transferred for the time being to another station, on the principle that the greater number banded the greater the chance of some being picked up by other parties along the line of migration.

The results of these banding operations in the fall of 1926 were: Adults banded, 649; immature birds, 292; total, 941; percentage of adults to immatures being respectively, 69 and 31 per cent. In the previous year the ratio was 52 to 48, apparently indicating that more young had been raised in 1925 than in 1926.

In addition to the birds banded, there were 291 "repeats" (*i. e.* of birds but recently banded), but out of the 381 birds banded here in 1925, only four "returns" were taken, which was a great surprise. It is hard to say whether this paucity of "returns" indicated a great loss of birds in the past year, or only the selection of a different route of migration. Possibly it was a combination of both causes that brought about this result. It is interesting to note that the four "returns" were

taken in the identical localities in which they were originally banded.

The largest number banded in one day was on September 21, when 112 were banded and 26 repeats taken in the traps, making 138 captured on that date. This occurred in a temporarily unused feeding corral, half a mile from Eagleville, and about a mile and a half almost due south of the McCully ranch station, where there were many willow trees, a stream, and great patches of thistles that had gone to seed, making ideal cover and feeding ground for this sparrow. It was difficult at first to cultivate in the sparrows at this banding station a liking for the bait offered, but this was accomplished finally, and 80 were banded on the first day that the triggers of the traps were set. Unfortunately the supply of bands ran low and others ordered were delayed so in arrival that the most important week of the migration was lost.

The traps were moved to the third banding station, on the Minto ranch, in order to use up there the few bands (85) that remained on the evening of September 21, in the hope of incidentally picking up some "returns" at that station where so many birds had been banded in the previous fall, when no work had been done at the feeding corrals. A day and a half of banding used up the remaining bands.

The new supply of bands that had been expected for several days finally arrived on October 2, but by this time the feeding corrals were entirely deserted and there were so few sparrows remaining at the other two stations that operations were abandoned on October 6. There were yet quite a few birds remaining, however, at one spot on the McCully ranch, this being a vegetable garden in which was a dense patch of raspberry bushes, but a flock of quail and a family of stray chickens became so interested in the traps that an attempt to band there had to be given up.

136. *Zonotrichia coronata* (Pallas). Golden-crowned Sparrow

Sparingly migrant in spring and fall. This species was found to be present in Deep Creek cañon, above 5000 feet, on May 9 and 11, 1923, when some were seen by myself and one taken (Mailliard, 1924, p. 213). One of the main reasons for making Surprise Valley, Modoc County, the headquarters for

field work in 1924 was that of definitely ascertaining the status of this species east of the Sierras in northern California, as there were no published records concerning this matter. An unfortunate combination of circumstances prevented the party from reaching Modoc County in time for the regular migration of the genus *Zonotrichia*, but we were fortunate in securing one of the last stragglers of *coronata*, which was taken by Mr. Frank Tose, near Eagleville, on May 24.

A fall trip was made to this locality to investigate further this matter of occurrence, and Eagleville was reached on September 3 (1924). As stated above, Gambel's Sparrow was very abundant in this fall migration, and one of the most important of our duties was that of endeavoring to identify any *coronata* among the hosts of *gambelii* present. With birds that move along from bush to bush so rapidly as do these sparrows when followed by an observer, this was no easy task. Constant watching failed to discover any *coronata* until September 15, when two were noted at a spring close to the Nevada line east of Eagleville, and one of them was secured. They were with a flock of *gambelii*. Another was shot near Eagleville, September 17, but not retrieved, and one was taken September 18. After that date one or two were seen every day or so. Altogether seven were secured, three more lost, and 10 or 12 others were positively identified, the last one being on September 30. Endeavor was made to get some sort of an idea as to what percentage of the *coronata* might be present among the *gambelii*, but this was a difficult result to obtain. The former seems to be a more wary bird than the latter, and, as any observer knows, a flock of these sparrows, feeding on the ground, at the slightest disturbance makes a dive for the nearest shelter, which is never far away. Under such circumstances it was seldom possible to examine carefully every individual in it before the whole flock would jump up and disappear, whereupon the performance would have to be repeated as soon as the band again settled down to feeding. The nearest estimate that I could make was that the number of *coronata* present was probably about two per cent of the number of *Zonotrichia* under observation. Two individuals of *coronata* were found on a brushy hillside apart from any other

sparrows, and three were noted in similar circumstances in the settlement, but in the latter case there were flocks of *gambelii* not very far off.

In the fall of 1925 the first bird of this species was noted September 20, when a female was secured among some *gambelii* that were in Eagle Creek cañon near town. This band of *Zonotrichia* was very wild and rapidly moved out of our reach up the steep mountain side, evidently with no intention of tarrying in that locality. Both Denver and I were under the impression that there were other *coronata* in the flock, but the birds were too elusive for us to obtain proof of this.

During banding operations that fall, no *coronata* were noted until October 7, when two were taken and banded at the McCully ranch, 1½ miles north of Eagleville, two more were banded there on October 9, and one the next day, making a total of six positively identified during the fall work of 1925. The five *coronata* were among the 176 *Zonotrichias* banded at the one station, making a percentage of 2.8, or a little higher than my estimate of the previous year, but none was taken at the other banding station where work was carried on. These experiences show that an appreciable number of Golden-crowned Sparrows evidently accompany Gambel's Sparrows in the migrations of the latter east of the Sierras in northern California, but that the *relative* number is small.

In the fall of 1926 the first Golden-crown was noted on September 10, after which an occasional one was seen or came into traps as long as banding was carried on. The actual proportion of this species to the *gambelii* present was not worked out, but it seemed to be about the same as in the two previous seasons.

137. *Spizella passerina arizonæ* Coues.
Western Chipping Sparrow

Very common summer visitant everywhere except, possibly, at the highest elevations. It either remains until late in the fall or migrates through the county at that time.

138. *Spizella breweri* Cassin. Brewer's Sparrow

Summer visitant almost anywhere in the sagebrush association, but not numerous until after the nesting season. It was fairly abundant in early September in the desert east of Eagleville, but had absolutely disappeared by the end of the month. These fall birds seem to be very wary and difficult to approach.

139. *Junco oreganus thurberi* Anthony. Sierra Junco

Common in all suitable places in spring, summer, and fall, but whether it is present during the winter is an unsettled question. People of Eagleville say that the "snowbirds" live around the settlement in winter, but these may be of another subspecies. If so, however, the time of arrival of such a race must be rather late, for careful observation up to October 14 failed to arouse any suspicion in my mind that there was any other form present among the many *thurberi* that fed close around our quarters in town, or among a lot that I examined at close range on the snow at the head of Granger Creek on the above date.

140. *Amphispiza bilineata deserticola* Ridgway.
Desert Sparrow

Found in summer on "both bases of Warner Mountains in Modoc County" (Grinnell, 1915, p. 121, and specimens in Mus. Vert. Zool.). Not noted by Academy parties at any collecting station.

141. *Amphispiza nevadensis nevadensis* (Ridgway).
Sage Sparrow

Summer visitant. Common, but not numerous, in the nesting season through the sagebrush association east of the Warner Mountains. Very common and rather numerous in the sagebrush on both sides of Surprise Valley in September, rapidly diminishing by the end of the month. In 1926 a few were still to be found as late as October 4.

142. *Melospiza melodia fallax* (Baird).

Mountain Song Sparrow

An adult female of this race was taken near Eagleville on September 20, 1926.

143. *Melospiza melodia fisherella* Oberholser.

Modoc Song Sparrow

Common in suitable places in spring, summer, and autumn, and possibly present to some extent in mild winters. In September, 1924, this sparrow was noted to be gathering in flocks of 30 to 40 individuals in places where there was good cover of dead weeds and plenty of seed softened by the rain. These bands were particularly scrutinized in an endeavor to find among them races of *Melospiza* other than *fisherella*, and a number of specimens were taken, but without result. In 1925 there was no noticeable assembling, and the song sparrows were much less abundant than in the previous year. Quite scarce in 1926.

144. *Melospiza lincolni lincolni* (Audubon).

Lincoln's Sparrow

Summer visitant. Breeds at the higher elevations on the Warner Mountains (Mus. Vert. Zool.). Two specimens were secured by the Academy party at Eagleville on September 8, another on September 11, 1924, and a female bird-of-the-year was taken September 30, 1925. Several other individuals of this subspecies were flushed but not secured.

145. *Passerella iliaca schistacea* Baird.

Slate-colored Sparrow

A female bird-of-the-year was secured on October 7, 1925, about a mile and a half north of Eagleville, under some heavy wild rose bushes among the sagebrush on the edge of the valley floor. An adult male of this race was taken on Sep-

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tember 14, 1926, near the summit of the Warner Range, about 13 miles southwest of Eagleville, at an altitude of nearly 8000 feet, and another at Eagleville on September 27.

146. *Passerella iliaca sinuosa* Ridgway. Valdez Fox Sparrow

A specimen of fox sparrow that appears to be most closely allied to this race was secured on September 19, 1924, beside a brushy streamlet at the eastern base of the foothills a few miles south of Eagleville. It seemed to be a lone straggler and is one of the two individuals of the *unalaschcensis* group of fox sparrows that were noted in this region, another having been taken on the foothills a little north of town on September 28, 1926.

147. *Passerella iliaca altivagans* Riley.

Alberta Fox Sparrow

A male bird-of-the-year was secured near Eagleville on September 30, and an adult male on October 4, 1926.

148. *Passerella iliaca fulva* Swarth.

Warner Mountain Fox Sparrow

Summer visitant. Breeding along the Warner Mountains, so low down as the 5000 foot level on the western side of the range in *Ceanothus* association, but at higher levels on the eastern and more arid side. Apparently not very evenly distributed, as there were ten or twelve pairs around the Buck Creek Forest Service Station, practically all in the station horse-paddock of a few acres, but there seemed to be none anywhere else in the vicinity. More numerous higher on the range. One was secured on the floor of Surprise Valley, 4700 feet, on October 7, and another on October 14, 1925, but these were the only ones noted at so low an elevation on the eastern side of the Warner Mountains.

149. *Pipilo maculatus curtatus* Grinnell. Nevada Towhee

Common in summer in places on the Warner Mountains; Steele Meadows in the fall (Mus. Vert. Zool.). Common in Surprise Valley along the eastern base of the Warner Mountains, where it seems to be more numerous than in any other part of the county. Found well up on the mountains, for I noted a pair at an altitude of about 8000 feet.

150. *Oberholseria chlorura* (Audubon). Green-tailed Towhee

Summer visitant in all suitable localities in lower Transition.

151. *Hedymeles melanocephalus capitalis* Baird.

Pacific Black-headed Grosbeak

Common summer visitant. First one was noted by the Academy party among the willows and cottonwoods near Cedarville on May 11 (1923). Noted singing so late as August 9, at Dry Creek (W. P. Taylor, 1910, MS).

152. *Passerina amoena* (Say). Lazuli Bunting

Very common summer visitant to Upper Sonoran and Transition zones. Found even out in the extreme desert association in places where there is some water within reasonable distance.

153. *Piranga ludoviciana* (Wilson). Western Tanager

Common summer visitant to all the coniferous association in the county. Earliest date noted was May 15 (1923).

154. *Petrochelidon lunifrons lunifrons* (Say). Cliff Swallow

Summer visitant in the plateau region. A few were noted in Cedarville on May 12, 1923. They rapidly increased in number, and on the third day thereafter they were already busily engaged in building.

155. *Hirundo erythrogaster* Boddaert. Barn Swallow

Summer visitant. Clear Lake, April 4 and 17, 1918 (Willett, 1919, p. 200). Noted May 15, 1923, in Cedarville. We also found it nesting at Jess Valley in June of that year. A few were noted in Eagleville in May and June, 1924. Apparently common, but not numerous, over the plateau region.

156. *Iridoprocne bicolor* (Vieillot). Tree Swallow

Numerous in the mountains near Camp Bidwell in last of July (Henshaw, 1879, p. 2268). Apparently much less numerous at present time. Alturas, June 11, 1910 (Mus. Vert. Zool.); nesting in Jess Valley in June, 1923; noted at Eagleville, May 25 and September 20, 1924; and at Menlo Baths, four miles south of Eagleville, on October 1, 1926.

157. *Tachycineta thalassina lepida* Mearns.

Northern Violet-green Swallow

Summer visitant to Transition zone, probably extending into Canadian, as it was taken at Warren Peak in July, 1910 (Mus. Vert. Zool.). Noted at Cedarville, May 13, 1923, and at Eagleville, May 26, 1924. On September 24, 1926, while I was banding birds near Eagleville, several of these swallows were seen flying about in an open field near by. With a .410 caliber collecting pistol I attempted to secure one or two for the record, but the strong wind then blowing made this almost impossible. A few were flying over the ponds at Menlo Baths on October 1, 1926.

158. *Bombycilla cedrorum* Vieillot. Cedar Waxwing

A small flock was seen in junipers near Clear Lake, April 8, 1918 (Willett, 1919, p. 206). The only time we met with this species in Modoc County was on September 20, 1924, when I secured a solitary male among some willows a little north of Eagleville. This makes only the fourth record of this bird in California east of the Sierras, yet residents of Eagleville state that this bird appears in winter in great numbers, to feed upon frozen apples that remain upon the trees in the small orchards around the settlement.

159. *Lanius ludovicianus excubitorides* Swainson.
White-rumped Shrike

Common resident of the sagebrush areas. More numerous in the fall in Surprise Valley, either coming down from higher elevations or migrating southward.

160. *Vireosylva gilva swainsonii* (Baird).
Western Warbling Vireo

Common summer visitant in Upper Sonoran and Transition zones. Found in practically every place visited in the spring.

161. *Lanivireo solitarius cassinii* (Xantus).
Cassin's Vireo

Summer visitant, common in suitable places in Transition zone. Noted at Sugar Hill in May; Parker Creek on June 20 and July 2; Dry Creek at end of July and up to August 3, 1910 (Mus. Vert. Zool.). Jess Valley in June, 1923 (Calif. Acad. Sci.). This species did not appear to be numerous anywhere.

162. *Vermivora ruficapilla gutturalis* (Ridgway).
Calaveras Warbler

Common summer visitant in Transition zone. Sugar Hill and Parker Creek in May and June, 1910 (Mus. Vert. Zool.); "common about camp" at latter place (W. P. Taylor, MS). We took it at Cedarville on May 11, 1923, and found it common at Buck Creek Ranger Station on both visits.

163. *Vermivora celata lutescens* (Ridgway).
Lutescent Warbler

Summer visitant in suitable association, common in nearly every place visited in the spring. Migrates southward commonly in the fall. Latest date of specimens taken was September 27 (1926).

164. *Dendroica æstiva brewsteri* Grinnell.
California Yellow Warbler

Common summer visitant. Found most frequently along streams or in willows. This warbler leaves for the south very soon after the young are reared. "Seen in abundance at Dry Creek August 2" (H. C. Bryant, 1910, MS). A few fall migrants from farther north noted in Surprise Valley and one or two secured by Academy parties.

165. *Dendroica auduboni auduboni* (J. K. Townsend).
Audubon's Warbler

Summer visitant, common wherever there are trees or willow growth of any size, though probably not breeding far away from actual timber. Numbers in the fall are increased by migrants from farther north.

166. *Dendroica nigrescens* (J. K. Townsend).
Black-throated Gray Warbler

Summer visitant to high Upper Sonoran and Transition zones (Mus. Vert. Zool.). A few noted at Jess Valley in June, 1923, but we did not come across this warbler elsewhere.

167. *Dendroica townsendi* (J. K. Townsend).
Townsend's Warbler

Rare migrant, possibly. I took a male in the Deep Creek cañon, May 13, 1923, and saw one or two at Cave Lake, in the extreme northern part of the county, at an elevation of over 7000 feet. There do not appear to be any other records for northeastern California.

168. *Oporornis tolmiei* (J. K. Townsend).
Macgillivray's Warbler

Common summer visitant in all suitable places.

169. *Geothlypis trichas occidentalis* Brewster.

Western Yellow-throat

Commonly found as a summer visitant wherever there is a sufficient growth of tules, reeds, etc., to make attractive cover for this species.

170. *Icteria virens longicauda* Lawrence. Long-tailed Chat

Summer visitant in Upper Sonoran and lower Transition zones in riparian association, but not numerous. Cedarville, about the end of July (Mus. Vert. Zool.). We took specimens at Willow Ranch (Goose Lake) on May 28, 1923, and at Eagleville, May 29, 1924.

171. *Wilsonia pusilla pileolata* (Pallas).

Pileolated Warbler

Summer visitant. "Summer specimens (in Mus. Vert. Zool.) from Sugar Hill, eastern Modoc County, are quite typical of *pileolata* and indicate the breeding of this race within the extreme northeastern corner of the state" (Grinnell, 1915, p. 152). In the spring of 1923 and 1924, warblers, supposedly of this race, were occasionally seen along the creeks in the bottoms of the cañons on the east side of the Warner Mountains, but none of us succeeded in securing any in the thick tangle which the birds inhabited, and they were so quick in their movements that it was exceedingly difficult to obtain a good view of them.

172. *Anthus rubescens* (Tunstall). Pipit

Spring and fall migrant. Rather common at Clear Lake in April, 1918 (Willett, 1919, p. 206). Noted on September 26, 1924, when several came to drink at a spring in the south end of Surprise Valley, and specimens secured. In early October, 1925, this species was occasionally noticed in the meadows near Eagleville, and on October 11 I saw several individuals along the road north of the village.

173. *Cinclus mexicanus unicolor* Bonaparte. Dipper

Common resident in the Warner Mountains (Grinnell, 1915, p. 153). An immature male was taken near Eagleville on September 18, 1924. Heard singing on September 20, 1925, in Eagle Creek cañon.

174. *Oreoscoptes montanus* (J. K. Townsend).

Sage Thrasher

Summer visitant to the sagebrush association in the plateau region. Not very numerous in the spring but abundant during the fall migration. The height of migration seems to be about the middle of September. At least, that was the case in Surprise Valley in 1924 and 1925. After that the numbers rapidly decreased. The last date on which it was noted was September 30 (1925), when we saw several and secured three specimens in a garden surrounding an old ranch house in the open meadow, a mile or more from any sort of appropriate cover for this species. The owner of the place had complained that there were some "strange birds" eating her strawberries. The marauders proved to be Sage Thrashers that found good cover in a gooseberry patch close by the strawberry bed. At this time there was a good-sized flock of *Zonotrichia l. gambelii* in the heavy growth of foliage in parts of this garden. An examination of this place a few days later showed that, in spite of the abundance of berries on the bushes and vines, no birds of any kind were then present.

175. *Salpinctes obsoletus obsoletus* (Say). Rock Wren

Summer visitant to rocky regions, without regard to altitude. Commonly found, yet not numerous at any place. Noted in September, 1924 and 1925, apparently migrating along the rocky mountain sides of Surprise Valley.

176. *Catherpes mexicanus conspersus* Ridgway. Cañon Wren

One individual was secured by W. P. Taylor at Dry Creek, July 30, 1910 (Mus. Vert. Zool., no. 5583), that has been provisionally placed under this head.

177. *Thryomanes bewickii drymæcus* Oberholser.
San Joaquin Wren

Resident in Upper Sonoran and Transition zones where good cover exists, but scarce in some parts. It is quite common in Surprise Valley, but not numerous in the spring. More abundant in the fall, either being driven out of the mountains by the snow, or migrating to a limited extent.

178. *Troglodytes ædon parkmanii* Audubon.
Western House Wren

Common summer visitant practically everywhere in the county. Noted in Surprise Valley as late as the middle of September.

179. *Nannus hiemalis pacificus* (Baird).
Western Winter Wren

On September 30, 1926, in company with Raymond Gilmore, I was looking for song sparrows at a small pond about six miles south of Eagleville, when a wren of this species suddenly appeared on the muddy edge of the pond. The bird was so close to me that I aimed, with the auxiliary barrel, a little to one side of it to avoid blowing it to pieces, but that little was just a trifle too much. The little wren was hard hit, but had sufficient energy left to enable it to flutter to some cat-tails six or eight yards from us, on one of which it clung for a moment and then fell among the trash that littered the surface of the water, where diligent search failed to discover it. The bird was close to us and in plain view in good light for sufficient time to admit of no doubt as to identification.

180. *Telmatodytes palustris plesius* (Oberholser).
Western Marsh Wren

Summer visitant in marshy places, nesting wherever there is good cover of reeds, tules, etc.

181. *Certhia familiaris zelotes* Osgood. Sierra Greeper

Resident on Warner Mountains (Grinnell, 1915, p. 161). Not met with by Academy parties in the plateau region of the county, but presumably more or less present there during the period of heavy snow on the mountains.

182. *Sitta carolinensis aculeata* Cassin.

Slender-billed Nuthatch

Common on the Warner Mountains (H. C. Bryant and W. P. Taylor, MSS, specimens in Mus. Vert. Zool.). The only place in the spring that this nuthatch was noted by the Academy party was at Jess Valley, where a brood was being raised under the bark of a long-prostrate pine tree. Specimens from Jess Valley and Eagleville are in the collection of the California Academy of Sciences. In the fall commonly found at the lower levels.

183. *Sitta canadensis* Linnæus. Red-breasted Nuthatch

Warner Mountains as summer visitant (Grinnell, 1915, p. 161). The field notes of the Museum of Vertebrate Zoology party of 1910 indicate an abundance of this species at the higher elevations of these mountains from June 27 to July 23. Seldom noted anywhere by Academy parties, which, however, did but little work at the higher levels. One specimen taken at Eagleville, September 3, 1926.

184. *Sitta pygmæa pygmæa* Vigors. Pygmy Nuthatch

Common resident on Warner Mountains (Mus. Vert. Zool.). Not met with at any place by the Academy parties.

185. *Bæolophus inornatus griseus* (Ridgway). Gray Titmouse

Scott's ranch, 10 miles southwest of Alturas, May 25, 1920, one specimen; Steele Meadows, September 27, 1922, two immatures (Mus. Vert. Zool.). "Rather common in junipers around Clear Lake" in April, 1918 (Willett, 1919,

p. 206). Two specimens were secured near Eagleville on September 18 and 22, respectively, 1926, and another was seen by myself on September 21.

186. *Penthestes gambeli abbreviatus* Grinnell.

Short-tailed Mountain Chickadee

Resident almost everywhere in the coniferous forest, and often found in the willow association.

187. *Psaltriparus minimus californicus* Ridgway.

California Bush-tit

Common resident. While this species does not appear to be numerous in most places, it is fairly well distributed over the county. It has been recorded principally from the west side of the Warner Mountains (Grinnell, 1915, p. 165), but there is one record for Raider Creek, on the eastern side (Dawson, 1916, p. 29). We came across it on several occasions and secured specimens along the east side of these mountains, on the edge of Surprise Valley, both in May and September.

188. *Psaltriparus plumbeus* (Baird). Lead-colored Bush-tit

A male hornotine of this species, no. 28645, Calif. Acad. of Sci., was taken by myself near Eagleville, October 1, 1925. In the Museum of Vertebrate Zoology there is a male of this species, no 28639, M. V. Z., that was taken on Shields Creek, a few miles east of Alturas, July 24, 1926, by J. Linsdale, at an altitude of 5000 feet. These two specimens apparently constitute the northernmost record of this species for the state of California.

Two bush-tits, Nos. 26179, 26180, C. A. S., taken near Cedarville May 13, 1923, show distinctive characters closely approaching *plumbeus* and suggesting a cross between this species and *P. m. californicus*, but with less brown on the head than has any example of that race that I have examined. These two birds are the parents of set no. 4041, C. A. S. oölogical collection.

189. *Regulus satrapa olivaceus* Baird.

Western Golden-crowned Kinglet

Summer visitant at high altitudes. "Heard" at head of North Fork of Parker Creek, Warner Mountains, early in July, 1910 (W. P. Taylor, MS), and one taken on July 2 (Mus. Vert. Zool.). "A family group encountered July 3, 1912, at an altitude of 7500 feet on the east slope of the Warner Range, and the species repeatedly seen thereafter near Eagle Peak" (Dawson, 1916, p. 30).

190. *Regulus calendula cineraceus* Grinnell.

Western Ruby-crowned Kinglet

Summer visitant, most abundant during migrations. Canadian zone of the Warner Mountains (Mus. Vert. Zool.) during nesting season. Common at Clear Lake in early April, 1918 (Willett, 1919, p. 207). Present in limited numbers in Surprise Valley in the latter half of September, most abundant about the end of the month, at least, in the territory that was covered by my own observations.

191. *Myadestes townsendi* (Audubon). Townsend's Solitaire

"Common resident of high Transition and Canadian zones on the Warner Mountains" (Grinnell, 1915, p. 169). Noted on many occasions by Academy parties at the higher elevations, and seen in Surprise Valley in the latter half of September, 1924, at times apparently in migration. A number were seen at various altitudes from 5000 feet up in Granger Cañon on October 14, 1925, at which time some of these birds were singing so vociferously as to be heard at astonishing distances in the still mountain air.

192. *Hylocichla ustulata swainsoni* (Tschudi).

Olive-backed Thrush

Fairly common summer visitant to Modoc County in vicinity of Warner Mountains (Grinnell, 1915, p. 170). Noted at Goose Lake in May, and found quite numerous at Jess Valley in June, 1923, by the Academy party.

193. *Hylocichla guttata guttata* (Pallas).

Alaska Hermit Thrush

On October 4, 1924, near Eagleville, I secured a male bird-of-the-year, and another specimen (sex undetermined) was taken on September 16, 1926. In spite of this species being such a common winter visitant in so large a part of California, there seems to be no published record of its occurrence in the northeastern part of the state.

194. *Hylocichla guttata sequoiensis* (Belding).

Sierra Hermit Thrush

Common summer visitant to the Warner Mountains (Grinnell, 1915, p. 171). A female that was caught in one of my mouse traps at Happy Camp Forest Service Station on June 12, 1924, has such a slim bill as to be noticeable at first glance, but which seems to be in this case only a matter of individual variation.

195. *Planesticus migratorius propinquus* (Ridgway).

Western Robin

Common in summer in all suitable places. According to the statement of inhabitants of Eagleville, it remains through the winter in limited numbers.

196. *Sialia mexicana occidentalis* J. K. Townsend.

Western Bluebird

Common summer visitant, breeding sparingly in Upper Sonoran and Transition. More numerous in the fall, when it is often seen in company with the following species.

197. *Sialia currucoides* (Bechstein). Mountain Bluebird

Summer visitant to the Warner Mountains, breeding in high Transition and Boreal zones. During migrations, especially in the fall, it is very abundant on the floor of Surprise Valley. The maximum of abundance was about the third week in September, after which the numbers rapidly grew less.

HYPOTHETICAL LIST OF BIRDS

1. *Rallus virginianus* Linnæus. Virginia Rail

"Numerous about all the marshy lakes" (Henshaw, 1897, p. 2302). The text of Henshaw's report on the ornithological part of the field work carried on by Party No. 1, California Section, of the Wheeler Geographical Survey in 1877-1878 shows that a stay was made at Fort Bidwell and work done in that vicinity, hence it seems to me proper to make mention of this rather indefinite record. This rail is not always easy to find and the fact that no further or more definite record of its presence has been published is no reason for believing that it is not at least a summer visitant to some of the marshes of the county. It is given by some of the authorities as common in summer *throughout the state*, but without definite records for Modoc County. It was not noted by any of the Academy parties.

2. *Totanus flavipes* (Gmelin). Yellow-legs

This bird is a rarely identified migrant, and there are no recent records of its occurrence in northeastern California. Recorded as abundant at Rhett (now Tule) Lake in former years (Newberry, 1857, p. 98).

3. *Bartramia longicauda* (Bechstein). Upland Plover

A bird of this species was shot at Tule Lake by Vernon Bailey on August 6, 1896 (Grinnell, 1915, p. 53). According to Doctor Grinnell, who made a special inquiry regarding this record (Cooke, U. S. Biological Surv. Bull. no. 35, 1910, p. 65), the wing only was sent to Washington for identification, but even that was not preserved. As the record gives only Tule Lake as the locality at which the bird was taken, and as this lake extends into Siskiyou County, California, and into southern Oregon, this record is not a very definite one, but it is the only one for California.

4. *Asio flammeus* (Pontoppidan). Short-eared Owl

"This owl was found to be common in the sedgy marshes about Warner Lake, Oregon, and doubtless inhabits similar localities throughout Eastern California and Nevada" (Henshaw, 1879, p. 2291). As Warner Lake (Crump Lake on recent maps) is only a few miles northeast of Surprise Valley, with no serious barrier intervening, Henshaw's assumption that this owl inhabited parts of Surprise Valley seems of sufficient value to be worth mentioning here. Mr. James A. Street,—storekeeper at Eagleville, erstwhile cattle rancher, and ever an ardent and observing game hunter,—who was brought up in this valley, told me that he had sometimes flushed a rather large owl in the meadows and found it was nesting on the ground. Unfortunately we did not come across any, to prove the identity, but it must have been the Short-eared Owl.

5. *Coccyzus americanus occidentalis* Ridgway.
California Cuckoo

Mr. James A. Street, whose statement was corroborated by others, stated that the California Cuckoo is often heard in Surprise Valley in midsummer, even in the village streets, but that it is extremely seldom one was seen. It is not heard before the end of June, but is commonly noticeable just before midsummer thunderstorms and is known by residents as the "rain crow," a country name for the eastern bird of this genus. Mr. Street has watched for this bird and has seen and studied it. His description of the bird was sufficiently accurate to be easily recognizable and he knew the note well.

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CHECK-LIST OF THE MAMMALS

- | | |
|---|---|
| 1. <i>Scapanus latimanus dilatus</i> True | 7. <i>Antrozous pallidus (pacificus?)</i> Merriam |
| 2. <i>Sorex amoenus</i> Merriam | 8. <i>Procyon</i> species |
| 3. <i>Sorex montereyensis mariposa</i> Grinnell | 9. <i>Mustela</i> species |
| 4. <i>Neosorex navigator navigator</i> Baird | 10. <i>Mustela vison</i> subspecies |
| 5. <i>Myotis yumanensis sociabilis</i> H. W. Grinnell | 11. <i>Spilogale gracilis saxatilis</i> Merriam |
| 6. <i>Myotis yumanensis altipetens</i> H. W. Grinnell | 12. <i>Mephitis occidentalis major</i> (Howell) |
| | 13. <i>Taxidea taxus neglecta</i> (Mearns) |
| | 14. <i>Canis lestes</i> Merriam |

- | | |
|---|---|
| 15. <i>Lynx fasciatus pallescens</i> Merriam | 34. <i>Castor subauratus shastensis</i> Taylor |
| 16. <i>Marmota flaviventris flaviventris</i>
(Audubon & Bachman) | 35. <i>Onychomys leucogaster fuscogriseus</i>
Anthony |
| 17. <i>Otospermophilus grammurus douglasii</i> (Richardson) | 36. <i>Reithrodontomys megalotis megalotis</i> (Baird) |
| 18. <i>Callospermophilus chrysodeirus chrysodeirus</i> (Merriam) | 37. <i>Peromyscus crinitus crinitus</i>
Merriam |
| 19. <i>Citellus oregonus</i> (Merriam) | 38. <i>Peromyscus maniculatus gambelii</i>
(Baird) |
| 20. <i>Anmospermophilus leucurus leucurus</i>
(Merriam) | 39. <i>Neotoma cinerea occidentalis</i> Baird |
| 21. <i>Eutamias minimus pictus</i> (Allen) | 40. <i>Microtus montanus montanus</i>
(Peale) |
| 22. <i>Eutamias amœnus amœnus</i> (Allen) | 41. <i>Microtus montanus yosemite</i>
Grinnell |
| 23. <i>Eutamias townsendii senex</i> (Allen) | 42. <i>Microtus mordax mordax</i> (Merriam) |
| 24. <i>Sciurus douglasii albolimbatus</i> Allen | 43. <i>Zapus major</i> Preble |
| 25. <i>Glaucomys sabrinus flaviventris</i>
Howell | 44. <i>Erithizon epixanthum epixanthum</i>
Brandt |
| 26. <i>Thomomys bottæ leucodon</i> Merriam | 45. <i>Ochotona schisticeps taylori</i>
Grinnell |
| 27. <i>Thomomys quadratus quadratus</i>
Merriam | 46. <i>Lepus townsendii townsendii</i>
Bachman |
| 28. <i>Perognathus nevadensis</i> Merriam | 47. <i>Lepus californicus wallawalla</i>
Merriam |
| 29. <i>Perognathus parvus mollipilosus</i>
Coues | 48. <i>Sylvilagus nuttallii nuttallii</i>
(Bachman) |
| 30. <i>Perognathus parvus olivaceus</i>
Merriam | 49. <i>Brachylagus idahoensis</i> (Merriam) |
| 31. <i>Dipodomys heermanni californicus</i>
Merriam | 50. <i>Odocoileus hemonicus hemonicus</i>
(Rafinesque) |
| 32. <i>Dipodomys ordii columbianus</i>
Merriam | 51. <i>Antilocapra americana americana</i>
(Ord) |
| 33. <i>Microdipodops megacephalus oregonus</i> Merriam | |



GENERAL ACCOUNT OF THE MAMMALS

1. *Scapanus latimanus dilatus* True. Klamath Mole

The type locality of the synonymous *truei* is Lake City, Surprise Valley (Merriam, 1897, p. 102). This species is common, but apparently not abundant, in parts of the Upper Sonoran and Transition zones. There seems to be comparatively little surface evidence of its presence, even in damp places that appear to be eminently adapted to its mode of life.

The specimens secured by the Academy parties were mostly taken in small orchards or village gardens that were frequently watered. The meadows were usually found to be remarkably free from mole mounds, that are so damaging to the knives of mowing machines in haying time.

April 27, 1927

2. *Sorex amœnus* Merriam. Sierra Shrew

Shrews from Sugar Hill, and Parker and Dry creeks (Mus. Vert. Zool.) have been referred by Hartley H. T. Jackson (*in ep.*) to this species.

3. *Sorex montereyensis mariposæ* Grinnell. Yosemite Shrew

Specimens in the Museum of Vertebrate Zoology were taken at Parker Creek, at an altitude of 5500 feet (Grinnell, 1913a, p. 190). No examples were secured by the Academy parties.

4. *Neosorex navigator navigator* Baird. Navigator Shrew

A female of this species was taken at Parker Creek, June 19, 1910, by a field party from the Museum of Vertebrate Zoology.

5. *Myotis yumanensis sociabilis* H. W. Grinnell. Tejon Bat

In the Academy collection is a female taken on September 20, 1913, at the head of the South Fork of Pit River. It has been provisionally referred to this race, but is rather too dark to be typical. This constitutes the only record for the county.

6. *Myotis yumanensis altipetens* H. W. Grinnell.
High Sierra Bat

Boreal zone of Warner Mountains (H. W. Grinnell, 1918, pp. 264-265). In the Museum of Vertebrate Zoology there are two specimens taken on the east face of Warren Peak at an altitude of 7800 feet, and in the Academy collection there is a male from the head of the South Fork of Pit River.

Bats seem to be scarce in the county, as apparently very few have been noted by field parties that have worked in that region.

7. *Antrozous pallidus* (*pacificus*?) Merriam.

Pacific Pallid Bat

A specimen of *Antrozous* from Goose Lake, now in the Museum of the San Diego Society of Natural History, has been provisionally referred to *pacificus* (H. W. Grinnell, 1918, p. 355). No other record for the county.

8. *Procyon*, species

Tracks of a coon were noted at Parker Creek on June 25, 1910 (W. P. Taylor, MS). When Gilmore and Covell were trapping at Silver Creek, in the Swaringer Flat, a few miles southeast of Eagleville, tracks of a coon were noted around one of their traps, but the coon was not caught.

9. *Mustela*, species

In the afternoon of June 2, 1923, Ranger Ivan Cuff reported to me that he had just seen a weasel, carrying a young cottontail rabbit in its mouth, pass the Pit River Forest Station. On noting a spectator, the weasel had disappeared into an Oregon Ground Squirrel burrow near the building. We at once went to the scene and dug up the burrow for over 100 feet, but found no occupant except the owner, trying vigorously to dig in farther. As all the ramifications had been followed up, we could only conclude that the weasel had escaped during the few moments that Ranger Cuff had taken to notify us of the occurrence. The presence of this carnivore was reported by so many of the farming residents of Surprise Valley that there can be no doubt of its existence there. Occasionally weasels had been killed by farmers, but not at the time of our visits, and no remains could be found. No specimens were obtained by Academy parties.

10. *Mustela vison*, subspecies

In 1910 a lady was reported to have caught 15 mink on Parker Creek, near which she lived (W. P. Taylor, MS). In September, 1922, evidence of its presence was noted at

Steele Meadow, this being confirmed by cowboys and settlers (J. Grinnell, MS). Residents stated that up to 1924 mink had been noted or taken at Silver Creek, but that either they had been all trapped or the dry seasons had driven them to better feeding grounds, for none had been seen since that year. Several had been seen and some caught on the Bare Ranch in the winter of 1923-4, but this seems to have occurred in Lassen County, just beyond the Modoc line. Efforts were made by Academy parties to trap mink, especially along the Pit River, near the Pit River Forest Service Station, but the present scarcity of mink, or perhaps the abundance of food at the time, made these efforts of no avail.

11. *Spilogale gracilis saxatilis* Merriam.

Great Basin Spotted Skunk

"Extreme northeastern corner of the state in Upper Sonoran zone" (Grinnell, 1913b, p. 295). This skunk appears to be seldom noticed by residents of Modoc County, well adapted as it is for making its presence known. Possibly it is mistaken for young of *Mephitis*. At Pit River Forest Service Station an adult was taken, September 1, 1926, but it could not be saved as a specimen. A juvenile was secured near the same place, September 29, and added to the Academy's collection. Continued efforts were made to secure some specimens from Surprise Valley, but without success.

12. *Mephitis occidentalis major* (Howell).

Great Basin Striped Skunk

Upper Sonoran and Transition zones of the county (Grinnell, 1913b, p. 295). Parker and Dry creeks (Mus. Vert. Zool.). Common, but not abundant, in Surprise Valley, where it was taken by the Academy field party in September, 1926.

13. *Taxidea taxus neglecta* (Mearns). California Badger

Common in Upper Sonoran and Transition zones and casually in Boreal (Grinnell, 1913b, p. 296). On two occasions, near Eageville, a large badger systematically robbed

one of our trap lines. The first theft took place on September 9, 1924, just after a light sprinkle of rain, and its tracks in the sandy soil showed that, accompanied by a companion not yet full grown, it had literally followed our footsteps from trap to trap. As there was abundant small rodent life in this locality, the traps were again strung out on September 15, on the chance of the badger not covering the ground that night, but the large one repeated the performance and was tracked to its hole, into which it was seen to disappear just in time to escape us.

During the several visits of the Academy parties to Modoc County, altogether aggregating nearly five months field work, these two occasions were the only ones when robbing of our traps of their contents was not confined to a trap or so now and then, and usually the robbery was of a cannibalistic character.

14. *Canis lestes* Merriam. Mountain Coyote

Quite common throughout the county. May be met with almost anywhere. I jumped one in a meadow near Eagleville, out of some grass that was barely high enough to hide it as it lay curled up on the ground. From the appearance of the grass, it was evident that the spot had been occupied for some hours.

The lair of this coyote was in the midst of a breeding colony of Nevada Red-wings. Warden G. W. Courtwright, now of Malin, Oregon, is quoted as stating that the coyotes take to the marshes in the spring, and there destroy numbers of game birds and eggs (Grinnell, MS).

On September 26, 1924, I visited some trappers living on the eastern side of Lower Lake, and there saw the skins of 18 coyotes that had been captured since the trapping season had opened a short time previously. These skins were mostly very large and in a fine state of peltage.

15. *Lynx fasciatus pallescens* Merriam. California Wildcat

Well distributed over the county as indicated by the specimens in the Museum of Vertebrate Zoology at Berkeley (Grinnell and Dixon, 1924, pp. 350-351).

16. *Marmota flaviventris flaviventris* (Audubon & Bachman).
Yellow-bellied Marmot

Common in Upper Sonoran and Transition zones. Noted by Academy parties to be especially numerous near the southern end of Surprise Valley along the eastern base of the foothills of the Warner Mountains. Also abundant along the southern exposure of the gorge wall of the South Fork of Pit River, just below the western end of Jess Valley.

17. *Otospermophilus grammurus douglasii* (Richardson).
Douglas Ground Squirrel

Commonly found in Upper Sonoran and Transition in many parts of the county, but nowhere sufficiently numerous as to be a very serious menace to crops or pasture.

18. *Callospermophilus chrysodeirus chrysodeirus* (Merriam).
Sierra Golden-mantled Ground Squirrel

Common along the mountains above 5000 feet altitude, but not especially numerous.

19. *Citellus oregonus* (Merriam). Oregon Ground Squirrel

This rodent is so abundant from early spring until midsummer as to be a great pest over the plateau region of the county. Its food consists principally of green forage, of which the quantities consumed are very large compared with the size of the animal. It has been estimated that these squirrels on a thickly colonized square mile of pasture land consume, during the growing season of the grass, enough forage to support something like 90 head of cattle (Grinnell and Dixon, 1919, p. 635). Fortunately it hibernates as soon as the succulence is gone from the grasses, etc., disappearing from view between the last week in July and the middle of August, according to locality and conditions.

In Modoc County the scarcity of pocket gophers (*Thomomys*) was quite noticeable in areas fairly thickly occu-

ped by this ground squirrel, so much so as to suggest the idea of the former being driven out by the latter. In the late fall, after the disappearance of the *Citellus*, there seemed to be some invasion of its colonies by *Thomomys*, for in late September and early October fresh gopher sign was noticed and gophers caught in alfalfa fields among the then unused entrances to the burrows of what had been earlier in the season well-populated colonies of this ground squirrel. In spring and early summer I had failed to find any indication of the presence of gophers in these same colonies. It should be stated that the irrigation in the localities examined was not being carried on by the flooding system, and that during irrigation the rodent had excellent opportunities for escape from drowning.

20. *Ammospermophilus leucurus leucurus* (Merriam).

Desert Antelope Ground Squirrel

At the time of the Academy party's visit to Surprise Valley in the spring of 1924, no record of this species in northeastern California had been published, but there were specimens in the Museum of Vertebrate Zoology that had been taken in the desert on the eastern side of Surprise Valley.

Residents of the valley told us that this squirrel was abundant in the desert region. In 1924, however, its population was at a minimum and only two specimens were secured (Mailliard, 1925, p. 58). In the fall of 1925, it was more numerous than it had been in the previous year, but had not yet attained anything like the numbers stated by the settlers to represent its usual status.

21. *Eutamias minimus pictus* (Allen). Sagebrush Chipmunk

This chipmunk is found to some extent in different parts of the plateau region of the county, as, for instance, Dry (Granger) Creek, and Alturas (Mus. Vert. Zool.); and Steele Meadow (Grinnell, MS). We found it in the desert region on the eastern side of Surprise Valley, opposite Eagleville, but it was not at all numerous. Several specimens were

taken there in the spring of 1924, but we did not succeed in securing many during the fall visits, when chipmunks that were probably of this species were occasionally seen scurrying from bush to bush, but which would not touch our baits and were too lively to be shot. Specimens were taken in September, 1926, in the sagebrush plain near the foothills on the western side of Surprise Valley.

22. *Eutamias amoenus amoenus* (Allen). Klamath Chipmunk

Common in the plateau region and on the Warner Mountains in suitable places. In some localities quite abundant.

23. *Eutamias townsendii senex* (Allen). Allen's Chipmunk

Found on the Warner Mountains. Sugar Hill, head of Dry Creek, etc., (Mus. Vert. Zool). Not found at lower levels.

24. *Sciurus douglasii albolimbatus* Allen. Sierra Chickaree

Common in coniferous forest of Boreal zone in Warner Mountains (Grinnell, 1913b, p. 356). Specimens taken by Academy party at 7600 feet altitude, 12 miles southwest of Eagleville, in June, 1924.

25. *Glaucomys sabrinus flaviventris* Howell.
Trinity Flying Squirrel

Transition and Boreal zones of the Warner Mountains (Mus. Vert. Zool.). This squirrel is so nocturnal in its habits that its presence often is unsuspected by residents of a locality in which it may occur, and there is good probability of its occurring also in other wooded districts of the county than those of the Warner Mountains.

26. *Thomomys bottæ leucodon* Merriam.

White-toothed Pocket Gopher

This gopher has been recorded from Fall River Mills, in the northeastern corner of Shasta County (Bailey, 1915, p. 48), but possibly it has not heretofore been taken inside the Modoc County line. Specimens were secured by Academy parties in the Pit River valley near the Pit River Forest Service Station in June, 1923, and late August, 1926. Some of the specimens appear to be fairly normal *leucodon*, while one or two seem to show some sign of variation, as is so often the case with this subspecies.

27. *Thomomys quadratus quadratus* Merriam.

Dalles Pocket Gopher

Common on most of the plateau region and mountains. Many records. At no place visited by the Academy parties were pocket gophers found to be abundant. In fact, considering the amount of meadowland with a growth of wild grasses and alfalfa furnishing abundant food for this genus, it is remarkably scarce. Several times residents complained of the depredations of gophers in their gardens, but examination showed that the trouble was caused by moles, one of which can do a lot of damage in a garden in a very short time.

Mr. Frank Tose, of our party, passed four days, June 8-12, 1924, at a spring close by what is known as Clyde's cabin, about 12 miles southwest of Eagleville, on the Warner Mountain range at an elevation of some 7500 feet, and in restricted spots found gophers closely bunched together. In quick succession he caught two large adult males in one burrow opening near the cabin, the trap being set within a few inches of the surface of the ground, and three more males were taken in nearby burrows within 24 hours. Other duties prevented the giving of much time to trapping gophers, however, and no females were secured. The curious part of this incident is the catching of two males in such quick succession in one branch hole (not the regular runway), and the presence in so restricted an area of so many males at the same time.

28. *Perognathus nevadensis* Merriam. Nevada Pocket Mouse

On June 13, 1924, I found in one of my traps in the desert, three miles east of Eagleville, a male of this species of pocket mouse. As this was the first record of its occurrence in California, every effort was made to obtain other specimens during that visit to the county and in the fall as well, but with no further success. On September 12, 1925, however, a male and female were taken in the same locality as was the first, but at no other time was one found in our traps.

This species has been recorded from northern Nevada and southern Oregon desert regions, so that its presence in northeastern California is perfectly logical.

29. *Perognathus parvus mollipilosus* Coues.

Coues's Pocket Mouse

Alturas (Osgood, 1900, p. 37). Warner Mountains (Mus. Vert. Zool.). Abundant along the base of the foothills on the west side of Surprise Valley, near Eagleville, and present to some extent in the desert region on the eastern side of the valley near the southern end of Middle Lake, as far as I have been able to identify the specimens taken by the Academy parties during several visits to this region. These specimens have been compared with a considerable series from the Warner Mountains, taken by Museum of Vertebrate Zoology field parties and now in that museum, and I am unable to distinguish the desert specimens from those taken in the mountains or on the western side of the valley. There seems to be more or less intergradation with *olivaceus*, both in color and skull characters.

30. *Perognathus parvus olivaceus* Merriam.

Great Basin Pocket Mouse

Lower Alkali Lake (Osgood, 1900, p. 38), one specimen identified from there. Lower Alkali or Lower Lake is only about a mile from Middle Lake above mentioned, and this specimen must have come from the same sort of association

as those obtained by the Academy parties. Probably it was an intermediate that happened to incline more toward this race than to *mollipilosus*.

31. *Dipodomys heermanni californicus* Merriam.
Northern California Kangaroo Rat

East side of Tule Lake, in the northwestern corner of Modoc County (Grinnell, 1922, pp. 40-41).

32. *Dipodomys ordii columbianus* (Merriam).
Columbian Kangaroo Rat

Prior to the visit of the Academy field party of 1924 to Surprise Valley, no record had appeared of the occurrence of this subspecies in California north of Plumas County. As it belonged in the Upper Sonoran zone of neighboring states, it might have been "expected to occur generally over the lower sagebrush levels in the elevated northeastern corner of California" (Grinnell, 1922, p. 71), and this expectation on the part of Doctor Grinnell was verified as soon as we visited the desert adjoining the Nevada line (Mailliard, 1925, p. 57).

On the sand dunes in the desert, this kangaroo rat was present in considerable numbers, mostly along the tops of the brushy sand ridges. None of the colonies examined appeared to be very extensive, and, judging by the absence of tracks among them, many of the burrows were unoccupied. In spite of this, the total number of individuals living in this part of the desert must have been considerable as, without great effort and only trapping for them for a few days at a time, we secured over 40 specimens in this one locality, which was from $2\frac{1}{2}$ to 3 miles east of Eagleville. During the various efforts of the Academy parties to obtain as many species as possible of the rodent inhabitants of this desert, it happened that few colonies of *Dipodomys* were discovered outside of this limited locality of less than one square mile, but there were large areas of desert that we had no opportunity to examine and which probably contained others.

33. *Microdipodops megacephalus oregonus* Merriam.

Oregon Kangaroo Mouse

In close and apparently commensal association with the kangaroo rats in the desert, was found this race of *Microdipodops*, which had not previously been reported as occurring in California (Mailliard, 1925, p. 57). It seemed to be present, as far as it was possible to judge, in rather smaller numbers than the *Dipodomys*. On September 18, 1925, two specimens were taken in a part of the desert covered more or less with broken rock and where the soil was a sandy clay. This was about two miles east of the sand dune country. No individual of *Microdipodops* was found away from a *Dipodomys* habitat.

34. *Castor subauratus shastensis* Taylor. Shasta Beaver

According to the statement of Game Warden G. W. Courtwright, there were beaver on the Pit River near Alturas in 1922, as shown by dams and signs (Grinnell, MS). On September 30, 1922, Doctor Grinnell visited a colony of beavers, estimated to contain about 25 members, on Willow Creek, near Steele Meadows, but no specimens were secured.

35. *Onychomys leucogaster fuscogriseus* Anthony.

Gray Grasshopper Mouse

High Upper Sonoran zone. Sugar Hill, Dry Creek, and Steel Meadows (Mus. Vert. Zool.). One taken by Academy party at Pit River Forest Service Station, September 26, 1926.

36. *Reithrodontomys megalotis megalotis* (Baird).

Desert Harvest Mouse

One male immature was secured by the Academy party in the desert east of Eagleville on June 9, 1924; an adult male was taken in the same place, September 10, 1925, and three adults, a male and two females, were taken there, September 4 and 5, 1926.

37. *Peromyscus crinitus crinitus* Merriam.

Idaho Canyon Mouse

Upper Sonoran zone. Sugar Hill, Goose Lake and Dry Creek (Mus. Vert. Zool.). Found by Academy parties near Eagleville in the spring of 1924 and the fall of 1925, but only in restricted areas.

38. *Peromyscus maniculatus gambelii* (Baird).

Gambel's White-footed Mouse

Found all over the county and quite abundant at times, even out in the desert region in places.

39. *Neotoma cinerea occidentalis* Baird.

Western Bushy-tailed Wood Rat

Common in the Transition and Boreal zones in suitable places. There is evidently a vertical migration of this species in the spring and fall. My own observations in spring developed much evidence of recent occupation of old buildings, hollow trees, rock slides, and lava "rim rock" formation at 5000 feet altitude and below, but, with the exception of two immature rats caught in an old hollow cedar tree at Buck Creek Forest Service Station, none was taken in May and June, even where the evidence showed that a large population had been present. The rangers stated that these rats were so numerous in the winter as to be a pest around old buildings, etc., coming down from the higher elevations with the advent of cold weather.

At the beginning of October, 1925, we set some rat traps in a very likely place in the mouth of Eagle Creek cañon where there was some evidence of occupation, but several nights trapping secured only one specimen of this wood rat, a very large old male. It seems as though this rat does not usually come down from the mountains until still later in the fall than early October, although at the time this one specimen was taken there was already considerable snow on the mountains, but the temperature was not very low. In the

Academy collection there are several adults taken by John Rowley at a high elevation on the Warner Mountains, September 21 to October 4, 1913. However, this migration seems to be affected by food or other conditions, for this rat was found in 1926 along the base of the Warner Range foothills in Surprise Valley as early as the end of August, and it was quite numerous through September, 1926. Weather at this time was relatively warm and free from heavy storms or serious snowfall on the mountains.

40. ***Microtus montanus montanus*** (Peale)

Peale's Meadow Mouse

Carr's Ranch, Rhett (Tule) Lake (Kellogg, 1922, p. 259; specimens in coll. Biol. Surv.).

41. ***Microtus montanus yosemite*** Grinnell.

Yosemite Meadow Mouse

This meadow mouse is usually present in most, if not all, of the meadows of any size in eastern Modoc County. The Museum of Vertebrate Zoology field party of 1910 secured specimens at many of its camps. On the other hand, the Academy party of 1923, although everywhere told what a pest this rodent was during the season for cutting the meadow hay, met with absolutely no success in finding it.

In Surprise Valley in May and June, 1924, some fresh sign was found near one old haystack, and some specimens were secured there, but apparently the drought of the previous winter had driven most of the meadow mice from the meadow to the tules of the laguna on the eastern edge of the valley, where they had taken refuge in a spot that was usually well covered with water (Mailliard, 1925, p. 103). The year 1923 was evidently one of extreme low ebb among the *Microtus* population of this part of the county, and the flood was just beginning in 1924.

42. *Microtus mordax mordax* (Merriam).

Cantankerous Meadow Mouse

Warner Mountains (Bailey, 1900, p. 50). Sugar Hill, Parker Creek, Warren Peak (Mus. Vert. Zool.).

43. *Zapus major* Preble. Warner Mountain Jumping Mouse

Transition and Boreal zones of Warner Mountains (Grinnell, 1913b, p. 342); Sugar Hill, Parker Creek, and Dry Creek (Mus. Vert. Zool.). On May 18, 1923, three specimens were taken at Buck Creek Forest Service Station, but on no other occasion during that spring was this genus noted. One was secured in this same place on June 16, and one at Happy Camp Forest Service Station on June 18, 1924.

44. *Erithizon epixanthum epixanthum* Brandt.

Yellow-haired Porcupine

Very common throughout the coniferous forests of the county, and a very undesirable visitor in vegetable gardens and to wooden buildings. Its appetite for wood, especially where any salt or grease has been spilled, causes a great deal of destruction to old buildings. It also does much damage to forests by devouring the bark from the upper portions of the trunk of pine saplings. In many places a considerable percentage of the young growth of the pine forest is seriously injured in this way.

45. *Ochotona schisticeps taylori* Grinnell.

Warner Mountain Cony

Type locality is Warren Peak (9000 feet altitude), Warner Mountains, Modoc County (Grinnell, 1912, pp. 129-130). Sugar Hill (Mus. Vert. Zool.). Taken by the Academy party in the end of September, 1924, in large rock slide at an altitude of about 8000 feet and some 12 miles southwest of Eagleville, on the Warner Mountains. This small mammal usually, but not always, inhabits rock slides. In June, 1924,

while the Academy party was at the Happy Camp Forest Service Station, on the west side of the Warner Mountains, Ranger Ivan Cuff stated that he had seen conies in an old crater in the lava bed at Quaking Asp Spring, altitude about 4500 feet, about 12 miles west of the station. We visited this locality on June 18, but the weather was too dark and cold to entice the conies from their retreats. It was my intention to camp there and secure proof of this story, but the "spring", which was merely snow water in a cavity of the lava, was so nearly dry, and the road to the spot was so rough that the idea of moving camp to it was abandoned. However, Ranger Cuff evidently knows conies and their habits, and there is no reason to doubt his statement that he has heard, watched for, and seen the conies at Quaking Asp.

That this rodent is more numerous and more widely distributed in the county than was at first supposed is proved by the result of our own investigations and by the reports of hunters who were asked to be on the lookout for it. Fresh sign was found in several places along the Warner Range by Gilmore, Covell, and myself, from 5000 feet upward, one small colony being in the rocky bottom of Eagle Cañon, just before the cañon opens abruptly into the rolling plain, about a mile westerly from Eagleville. Another colony of conies was noted by Gilmore on a hill above the Pit River Forest Service Station in September, 1926, when examples were brought to me for identification. A large colony exists near the top of the Warner Range, a little southeast of Eagle Peak, at close to 9000 feet elevation, where several specimens were secured. This colony is about a mile north of the rock slide where the specimens above mentioned were secured in September, 1924.

46. ***Lepus townsendii townsendii*** Bachman.

Western White-tailed Jack Rabbit

Upper Sonoran and Transition zones of the Modoc region (Grinnell, 1913b, p. 395). Goose Lake (Nelson, 1909, p. 82). Parker Creek, Warner Mountains (Mus. Vert. Zool.). Nowhere abundant. I saw several in May, 1923, between Buck Creek Service Station and Goose Lake, but failed to secure

any. In 1926 the Academy party secured a specimen near Eagleville, September 19, and another near the Pit River Forest Service Station, September 27. Several were reported to have been seen in Surprise Valley at that time.

47. *Lepus californicus wallawalla* Merriam.

Washington Jack Rabbit

Cedarville (Nelson, 1909, p. 133). Alturas and Dry Creek (Mus. Vert. Zool.). Many noted by Academy parties in Surprise Valley and elsewhere. Especially numerous in the desert east of Eagleville. Specimens in the Academy collection are from Alturas and Eagleville.

48. *Sylvilagus nuttallii nuttallii* (Bachman).

Washington Cottontail

Upper Sonoran and Transition zones in parts of the Modoc region (Grinnell, 1913b, p. 362). Noted by Academy parties in practically the same localities as was the Washington Jack Rabbit. The Academy collection includes specimens from South Fork of Pit River, Happy Camp, Jess Valley, Eagleville, and Cedarville.

49. *Brachylagus idahoensis* (Merriam). Idaho Pygmy Rabbit

Upper Sonoran zone. Recorded from Goose Lake (Nelson, 1909, p. 278). Not seen by Academy parties, although considerable search was made for it along the Nevada side of Surprise Valley, where it was reported to be present and where were found some burrows that appeared to have been occupied by this species.

50. *Odocoileus hemonicus hemonicus* (Rafinesque).

Rocky Mountain Mule Deer

Modoc region (Grinnell, 1913, p. 367). Common in the mountain ranges, but not abundant at the present time. Does and fawns come down within a short distance of Eagleville, as

noted by myself. Near Quaking Asp Spring, in the plateau region, we startled a young fawn by the roadside. In the fall of 1926 the number of deer on the Warner Range had increased very perceptibly, seemingly as the result of an invasion from the Nevada mountains on the eastern side of Surprise Valley, where a large game refuge has been established. This invasion of the Warners was probably brought about by the scarcity of water on the Nevada side in this year of drought.

51. *Antilocapra americana americana* (Ord).

Pronghorn Antelope

Modoc region (Grinnell, 1913, p. 368). A band of about 125 individuals exists in the western part of the county, and ranges into Siskiyou County. It is fed upon hay to some extent in the winter season. This band is said to be slightly on the increase. According to the reports of farmers and cattlemen in the eastern part of the county, there are a few antelope that range from that region into Nevada.

HYPOTHETICAL LIST OF MAMMALS

1. *Martes caurina sierræ* Grinnell & Storer.

Sierra Pine Marten

The presumed range of this race of pine martens includes the Warner Mountain range in Modoc County (Grinnell and Dixon, 1926, p. 415), but no specimens have been recorded from there.

2. *Canis gigas* (Townsend). Northwestern Timber Wolf

On October 2, 1922, Warden Courtwright stated that four wolves were "recently seen" near Straw (Grinnell, MS). These wolves probably came in from Oregon, as the species is practically extinct in California.

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